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TOME XXIII. — FASCICULES 1 et 2

BULLETIN

DE LA

SOCIÉTÉ ROYALE DE GÉOGRAPHIE

D'ÉGYPTE





Palais de la Bourse
BORDEAUX

NOVEMBRE 1949

SOCIÉTÉ ROYALE DE GÉOGRAPHIE D'ÉGYPTE.

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NOVEMBRE 1949

HASSAN SADEK PACHA

(1891-1949).

A l'ouverture de la séance du Conseil d'Administration, tenue le 4 juin 1949, notre Président, Son Excellence Chérif Sabri Pacha, prend la parole en ces termes :

«Hassan Sadek Pacha n'est plus. Sa perte si soudaine est une des plus cruelles que la Société Royale de Géographie ait jamais éprouvée. C'est une grande figure qui disparaît des horizons de la science.

«Hassan Sadek faisait partie de notre Société depuis 1925, d'abord comme membre actif, puis comme membre du Conseil et enfin en 1937 comme Vice-Président.

«Dès 1920, le jeune Hassan Sadek avait déjà acquis en matière de Géologie une compétence reconnue hors de nos frontières. D'abord avec son maître le Docteur Hume, puis seul, il avait parcouru une grande partie du Désert Oriental et du Sinaï dont il avait relevé les affleurements géologiques. Ses dons naturels ont fait de lui, sans conteste, un des géologues les plus complets de sa génération.

«En 1925, lorsque notre Société organisa le XI[e] Congrès Géographique International, Hassan Sadek se dépensa sans compter. Il a joué un rôle prépondérant dans l'organisation scientifique et matérielle de ce Congrès.

«Les louanges de ses activités scientifiques ne sont plus à faire. Ses belles études assureront à son nom une pérennité que bien d'autres pourraient désirer. Mais à côté des qualités du savant nous ne devons pas oublier les qualités de l'homme. Il était simple, très accessible et foncièrement bon, toujours prêt à rendre service sans ménager ses peines.

«Chacun de nous conservera le souvenir du Collègue éminent que nous venons de perdre beaucoup trop tôt.»

LISTE CHRONOLOGIQUE

DES PRINCIPAUX TRAVAUX DE HASSAN SADEK PACHA.

1920. *Preliminary General Report on the Occurrence of Petroleum in Western Sinai* (in collaboration with Hume, Madgwick and Moon). Egypt, Min. Fin., Cairo (Petrol Research Ser.). *Bull.* n° 2, 15 pp. with 5 pls. and 2 maps.

—— *Preliminary Geological Report on Gebel Nezzazat* (*Western Sinai*) (in collaboration with Hume, Madgwick and Moon). Egypt, Min. Fin., Cairo (Petrol Research Ser.). *Bull.* n° 3, 8 pp. with one plate and 2 maps.

—— *Preliminary Geological Report on Gebel Tanka Area* (in collaboration with Hume, Madgwick and Moon). Egypt, Min. Fin., Cairo (Petrol Research Ser.). *Bull.* n° 4, 16 pp. with 7 pls. and 2 maps.

—— *Preliminary Geological Report on the Quseir-Safaga District, particularly the Wadi Mureikha Area* (in collaboration with Hume, Madgwick and Moon). Egypt, Min. Fin., Cairo (Petrol Research Ser.). *Bull.* n° 5, 15 pp. with 2 pls. and 2 maps.

—— *Preliminary Geological Report on South Zeit Area* (in collaboration with Hume, Madgwick and Moon). Egypt. Min. Fin., Cairo (Petrol Research Ser.). *Bull.* n° 7, 24 pp. with 6 pls. and a geol. maps.

—— *Preliminary Geological Report on the Abu Shaar el Qibli* (*Black Hill*) *District.* (in collaboration with Madgwick and Moon). Egypt, Min. Fin., Cairo (Petrol Research Ser.). *Bull.* n° 6, 11 pp. with one plate, a section and 2 maps.

—— *Preliminary Geological Report on Ras Dib Area* (in collaboration with Moon). Egypt, Min. Fin., Cairo (Petrol Research Ser.). *Bull.* n° 8, 13 pp. with 7 pls. and a map.

1921. *Preliminary Geological Report on Abu Durba* (*Western Sinai*) (in collaboration with Hume, Madgwick and Moon). Egypt, Min. Fin., Cairo (Petrol Research Ser.). *Bull.* n° 1, 20 pp. with 5 pls. and 2 geol. maps.

—— *The Jurassic and Lower Cretaceous Rocks of Northern Sinai* (in collaboration with Hume, Fourtau and Moon). Geol. Mag. London, vol. LVIII, n° 686, pp. 339-347, with 2 sketch maps in text.

—— *Topography and Geology of Northern Sinai : Part I. Session 1919-1920* (in collaboration with Moon). Egypt, Min. Fin., Cairo (Petrol Research Ser.). *Bull.* n° 10, VII + 154 pp. with 9 pls., 9 maps and over 70 photogr.

1922. *Preliminary Geological Report on the Wadi Gharandel Area* (*North of Gebel Hammam Faraun West Sinai*) (in collaboration with Moon). Egypt, Min. Fin., Cairo (Petrol Research Ser.). *Bull.* n° 12, IV + 41 pp. with 2 maps, one section and 7 photogr.

1925. *The distribution of the Jurassic Formation in Egypt and Sinai,* c. r. Congr. Intern. Geol. Liège (sess. XIII, 1922), pp. 1039-1048, with 2 text-figs. (sketch map and section).

—— *Preliminary Geological Report on Gebel Khoshera Area* (*Western Sinai*) (in collaboration with Moon). Egypt, Min. Fin. Cairo, (Petrol Research Ser.). *Bull.* n° 9, V + 40 pp. with 3 pls., 3 maps and 14 photogr.

—— *An Upper Miocene Fresh Water Formation in Egypt,* c. r. Congr. Intern. Geol. Liège (sess. XIII, 1922), pp. 1049-1057, with 2 text-figs. (sketch map and section).

—— *Account of the Excursion to Luxor,* c. r. Congr. Intern. Geogr., Le Caire (sess. XI, 1925), tome I, pp. 155-158.

1926. *A Scientific Study of Scenery in Sinai,* c. r. Congr. Intern. Le Caire (sess. XI, 1925), tome III, pp. 144-154, with 7 pls. and a sketch map.

—— *The Geography and Geology of the District between Gebel Ataqa and el-Galala el-Bahariya* (*Gulf of Suez*). Egypt, Min. Fin., (Geological Survey) Cairo, Survey Paper n° 40, VIII + 120 pp. with 2 maps and 12 text-figs.

1927. *Structural Features of Sinai Peninsula.* Pen-Am. Geol. Des Moines, vol. XLVII, pp. 321-330, pls. XLI-XLII.

1928. *The Principal Structural Features of the Peninsula of Sinai,* c. r. Congr. Intern. Geol. Madrid (sess. XIV, 1926), fasc. 3, pp. 895-900, with a sketch map.

1929. الجيولوجيا — القاهرة — ٢٣٤ ص .

1931. *Egypt's Wealth of Minerals. Part II. What is being won.* The Manchester Guardian Commercial, p. 17, with a sketch map in text.

1936. أثر الثروة المعدنية فى نهضة مصر الصناعية — جريدة الأهرام ٤ مارس سنة ١٩٣٦

1938. الحديد فى مصر . الكتاب السنوى الثامن (عام ١٩٣٧) للمجمع العلمى للثقافة العلمية . القاهرة ١٩٣٨ . ص ٢١ — ٣٦

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DROIT ET GÉOGRAPHIE

PAR

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La Géographie se classe parmi les plus anciennes Sciences humaines et, cependant, ne semble-t-elle pas en perpétuelle évolution?

Des opinions contraires s'affrontent et s'efforcent de modifier l'orientation de la Géographie, sa position parmi les autres disciplines.

1° Une force — qui semble au premier abord un progrès — attire la Géographie vers des voies nouvelles.

Cette tendance, dont les effets ne sont pas tous profitables à la géographie, s'est manifestée de bien des manières : tantôt les géographes empruntent à la géologie ses méthodes [1], tantôt ils se tournent du côté de la météorologie [2], ou bien ils accentuent l'aspect politique de la géographie humaine, ou posent les bases d'une géographie sociale [3].

---

[1] Depuis vingt ans, les géographes ont fait passer la confection et l'interprétation des coupes géologiques du terrain au premier plan des exercices de formation des futurs géographes.

[2] De nombreux traités de géographie physique donnent des explications météorologiques détaillées des phénomènes qui conditionnent le temps ; il apparaît — si l'on en croit les spécialistes de la météorologie — que les géographes se font souvent une conception inexacte des problèmes, en désaccord avec les plus récents travaux des spécialistes.

[3] Géographie spécialisée dans l'examen des groupes sociaux et des genres de vie, répartis à la surface du globe (voir Pierre George, *Géogr. écon. et soc. de la France,* Paris 1945, 2e éd. ; du même auteur, *Géogr. sociale du Monde,* Paris 1946).

Des géographes suggèrent la création d'une géographie médicale [1].

Ces poussées d'expansion géographique — ambitieuses, il faut bien le reconnaître — sont à rapprocher d'autres tentatives — extérieures à la géographie par leur origine — et qui peuvent aussi élargir le champ des études géographiques [2-3].

2° Cependant, un courant d'idées contraires n'a jamais cessé de s'exercer, qui tend à ramener la géographie à des proportions plus modestes, à un idéal plus humble.

Sans s'attarder au différend, désormais légendaire, des géographes et des géologues, il convient de rappeler les objections faites à la géographie humaine par les partisans de la morphologie sociale.

Lorsque les géographes entreprirent, il y a 75 ans, de donner plus d'ampleur à l'étude des groupements humains dans leurs cadres territoriaux (géographie humaine), certains d'entre eux eurent le tort d'exagérer les prétentions géographiques : témoin, l'Allemand Ratzel [4] qui pouvait retrouver dans le sol et le climat d'une région tous les principes directeurs de l'activité humaine.

Une pareille thèse fut contredite avec vigueur par les Sociologues ;

(1) Jules Sion (*L'Asie des Moussons,* 1re partie, p. 54, t. IX de la *Géogr. univ.* de V. de la Blache et Gallois, Paris 1928) y verrait le moyen d'éclaircir les influences du climat sur l'homme (du climat lourd des deltas asiatiques, par exemple, sur le caractère résigné des sédentaires qui les peuplent).

(2) Gabriel Le Bras, professeur à la Faculté de Droit de Paris et à l'École des Hautes Études, est le spécialiste incontesté d'une discipline historique nouvelle, l'étude de la Pratique religieuse ; sur ses directives, d'intéressants essais de représentation cartographique, de groupement territorial des phénomènes étudiés par lui ont été menés à l'Institut de Géographie de l'Université de Paris.

(3) Deux éminents juristes, Marc Desserteaux et René David, spécialistes de l'étude des Législations comparées, ont préconisé récemment l'établissement de rapports plus étroits entre le droit comparé et la géographie ; ils soulignent l'influence que les conditions géographiques de la vie dans une contrée auraient (selon eux) sur les institutions juridiques (voir René David, *La géogr. et le droit, Rev. de géogr. humaine et d'ethnolog.,* 1948, p. 78 ; Marc Desserteaux, *Droit comparé et géogr. humaine, Annales de géogr.,* 1947, p. 81 ; du même auteur, *De l'influence des facteurs géogr. sur la diversité du droit, Bull. Soc. Législ. comp.,* 1948, p. 216).

(4) F. Ratzel, *Politische Geogr.,* Berlin 1903, et *Antropogeographie*, Stuttgart 1909.

montrant que la position de Ratzel n'était pas soutenable, ils forcèrent leur démonstration et conclurent que la nature physique n'a aucune influence sur l'évolution des groupes humains ; seule, la morphologie sociale serait — pour eux — susceptible de résoudre les problèmes considérés [1].

Comme le montre de façon saisissante Lucien Febvre, un historien, donc un neutre dans ce conflit, il fallut toute la modération et la rigueur scientifique de Vidal de la Blache pour donner à la géographie humaine sa véritable ligne de conduite : rechercher dans quelle mesure les phénomènes naturels peuvent exercer une influence sur les groupes humains [2].

Science carrefour, réceptive aux idées qui soufflent, curieuse à juste titre des méthodes nouvelles, la géographie doit cependant — comme l'a voulu Vidal de la Blache — se montrer toute prudence et auto-critique lorsqu'on lui propose d'élargir l'objet de son étude : elle s'épargnera ainsi des critiques, des revirements, qui signifient toujours, pour une science, un affaiblissement.

Il était bon de rappeler ce principe au moment où les rapports possibles du droit et de la géographie préoccupent à la fois les géographes et les juristes [3].

D'une part, suivant René David et Marc Desserteaux, les spécialistes du droit comparé vont, sans aucun doute, demander aux géographes leur collaboration pour une exploitation de la géographie au profit du droit : représentation cartographique des phénomènes juridiques, étude en commun des influences de la nature sur le droit.

D'autre part, les géographes ne peuvent pas éluder davantage le problème de la contribution que le droit a pu apporter à la géographie humaine.

(1) Voir notamment Simiand, *Méthode historique et science sociale, Rev. Synthèse,* Paris 1903 ; sur les méthodes de la Morphologie sociale, on consultera l'ouvrage de Maurice Halbwachs (*Morphologie sociale,* Paris 1938).

(2) Lucien Febvre retrace de façon magistrale toute la lutte, avec ses origines, ses péripéties et ses conséquences (*La terre et l'évolution humaine, introduction géographique à l'histoire,* vol. IV de la Collection de l'*Évolution de l'humanité,* dirigée par Henri Berr, Paris 1922).

(3) R. David et M. Desserteaux, *op. cit.*

Notre époque est favorable à cet aspect nouveau de la géographie : le droit n'a-t-il pas récemment resserré ses rapports avec l'économie [1] et les Sciences sociales [2] ?

Bien que juriste et parce que nous adressant à des géographes — par reconnaissance aussi pour la formation géographique que nous a donnée à la Sorbonne M. Emm. de Martonne, — c'est du point de vue des géographes que nous examinerons les rapports de ce couple inattendu : droit et géographie.

Deux problèmes seront successivement évoqués : l'utilité du droit dans l'étude géographique et la méthode d'exploitation du droit par le géographe.

I

Si nous nous proposons de passer en revue successivement un certain nombre de points où le droit touche à la géographie, il n'est toutefois nullement dans nos intentions de dresser une liste exhaustive de ces points de contact : on comprendra aisément ce que ce dernier objectif aurait de prématuré, dans un domaine d'études absolument nouveau.

Une remarque s'impose d'abord : les points de contact entre le droit et la géographie n'ont pas été mis en valeur ni systématisés ; il est aisé cependant de constater que certains d'entre eux se sont établis empiriquement : n'est-il pas remarquable, en effet, qu'un même problème

[1] Sinon, comment expliquer les mesures juridiques qui sont à la base des plans d'organisation économique modernes? Le *New Deal* du Président Roosevelt et la Planification russe (voir sur ces deux points Ch. Bettelheim, *Problèmes théor. et prat. de la Planification,* Paris 1946), les Nationalisations d'Industries (jugées essentielles à la vie économique du pays par l'actuelle Constitution française ou par le souple critère de l'opinion publique britannique), toutes ces mesures, spectaculaires et politiques, sont destinées à substituer un régime juridique nouveau à un régime ancien, jugé périmé : ne soulignent-elles pas l'interdépendance du droit et de l'économie?

[2] Lorsqu'une nation entreprend de porter remède à un point, jugé défectueux, de l'organisation sociale, elle ajoute une loi à sa législation sociale : c'est encore du droit.

(celui de la division du sol rural dans l'ancienne France) soit étudié à la fois par des géographes et des juristes, auxquels s'ajoutent des historiens [1] ?

C'est qu'en effet l'étude des règles juridiques — que la Société française a imposé au cours de son histoire à ceux qui voulaient posséder le sol — explique un grand nombre des traits du paysage actuel de nos campagnes [2].

On peut donc tenir pour une vérité d'expérience que le géographe ne peut ignorer les règles juridiques de la propriété : la propriété — type du droit réel, c'est-à-dire du lien juridique qui met un objet matériel au pouvoir d'un homme — pose d'ailleurs de délicats problèmes auxquels chaque époque répond d'une manière qui lui est propre [3]. Si la propriété, droit réel par excellence, exerce une influence indéniable sur la formation du paysage, on peut également induire de cette première constatation que les autres droits réels reconnus par la science juridique se traduiront dans l'aspect physique de la campagne.

Sans crainte de se tromper, on peut penser que c'est dans l'ensemble

[1] Qui veut étudier la formation du paysage rural français doit se reporter à des ouvrages écrits par des hommes de disciplines différentes : un géographe, Roger Dion (*Essai sur la formation du paysage rural français,* Tours 1934) ; deux juristes, P. Violet (*Histoire du droit civil français,* Paris 1905, 3e éd.) et Chénon (*Histoire générale du droit public et privé,* t. I, 1926, t. II, par Olivier-Martin, 1930) ; un historien, Marc Bloc (*Les caractères originaux de l'Histoire rurale française,* Paris 1931) ; ceci pour s'en tenir, dans chaque science, à des ouvrages de tout premier plan.

[2] Notamment la forme des pièces de terre, leur groupement autour du village, la forme des villages eux-mêmes, la structure des exploitations individuelles (tous problèmes auxquels une solution a été apportée dans un passé lointain, lorsque, le défrichage du sol étant terminé, la propriété individuelle s'est substituée au système des Droits de la Collectivité).

[3] Admission du droit de propriété individuel sur la terre ; limitations apportées au droit de propriété par l'État ou par une Collectivité ; transmission de la propriété par l'héritage, avec ou sans morcellement de la surface ; séparation du droit de propriété proprement dit et du droit d'exploiter la terre : constitution au profit de l'exploitant d'un droit stable, véritable droit réel, fief ou censive, ou d'un droit précaire, bail.

des règles par lesquelles l'homme peut exercer un pouvoir direct sur la terre ou les immeubles (propriété et droits réels autres que la propriété, encore appelés droits réels secondaires) que le géographe trouvera les principales influences juridiques sur la géographie [1].

D'autre part, il est facile de concevoir qu'à toutes les époques, et spécialement dans notre temps où sévit le dirigisme, l'État jugera nécessaire de limiter l'exercice par l'individu de la propriété et des droits réels secondaires ; ces limitations seront éparpillées, soit dans des textes de droit civil complétant le Code civil, soit dans les nombreux textes de notre droit administratif (lois, décrets, arrêtés ministériels, arrêtés préfectoraux, arrêtés municipaux) [2].

Le champ d'investigations étant limité grossièrement de la sorte, il nous reste à vérifier notre hypothèse en examinant l'aspect pratique de la question, c'est-à-dire en passant en revue les signes extérieurs qui manifestent sur le terrain les situations juridiques [3] :

1° Le tracé des clôtures, la position des bornes apposées sur le terrain par les géomètres indiquent les limites de chaque propriété individuelle ; c'est la représentation sur le terrain du plan cadastral, qui, lui, est un document juridique [3].

2° L'absence de clôtures, la discontinuité des clôtures, la largeur inusitée de certains chemins ruraux, la similitude des cultures ou des jachères dans un même quartier d'un terroir sont autant de signes d'une mise en valeur collective du terrain : droit de vaine pâture, permettant

[1] Notre Code civil groupe l'étude du droit de propriété et de tous les autres droits réels dans le plus court de ses trois livres (livre II : des biens et des différentes modifications de la propriété ; articles 516 à 710 du Code civil) ; tout géographe aurait intérêt à faire cette lecture, de préférence dans une édition pratique du Code, rapprochant de certains articles les lois postérieures qui les ont complétés (à titre d'exemple, Code civil annoté de la *Petite Collection Dalloz*, Paris).

[2] Il est plus difficile de prendre connaissance des textes de nos lois administratives, qui sont nombreuses et mal ordonnées ; certains éditeurs en ont fait des recueils (Code administratif, dans la *Petite Collection Dalloz* précitée).

[3] Nous ne reprendrons pas ici l'étude des indices qui traduisent sur le terrain une organisation juridique passée ; que le lecteur veuille bien se reporter aux travaux de Roger Dion et Marc Bloc, précités.

à chacun des habitants d'une commune de faire paître leurs bestiaux sur des terres appartenant à autrui ; —droit d'affouage, permettant un ravitaillement collectif en bois de chauffage dans une forêt ; — droit de ramasser certains fruits [1].

3° Tout le système de canaux, principaux et secondaires, de rigoles particulières, de vannes de distribution et de prise d'eau, de déversoirs et de conduits, modifie deux fois l'aspect physique d'une région : par la série des accidents qui rompent la monotonie d'une grande plaine ou d'un delta, d'abord ; ensuite, par la vie végétale forcée qui apparaît dans les intervalles du réseau d'irrigation et grâce à lui [2].

Tout cet appareil utile, tous ces résultats visibles n'ont été possibles qu'après un accord juridique entre les futurs bénéficiaires, dont les signes extérieurs sont les témoins [3].

4° Les digues qui protègent une région contre les inondations d'un fleuve, ou un pâturage gagné sur la mer contre un retour de celle-ci, ou une baie contre l'ensablement dû au courant côtier, traduisent sur le sol une organisation juridique : problème de droit public ou de droit privé, suivant que l'intervention de l'État s'est manifestée ou non [4].

[1] Tous ces droits sont des vestiges certains d'une époque où l'appropriation du terrain par les particuliers n'était pas encore admise ; — la vaine pâture, pour ne parler que d'elle, exerce une influence déterminante sur le paysage ; c'est le rachat des droits de vaine pâture qui permit à l'Angleterre de changer à la fois le mode d'exploitation de son sol et le paysage dénudé de l'*open field* : ainsi naquirent les haies anglaises, désormais fameuses (voir G. M. Trevelyan, *English Social History*, Londres 1942).

[2] C'est un substratum juridique, établi le plus souvent par des règles coutumières, qui rend compte des formes d'une huerta espagnole, ou d'une rizière tonkinoise, ou d'une palmeraie nord-africaine.

[3] Les entreprises modernes d'irrigation (comme les drainages, les assèchements de marais, les reboisements) proviennent en général d'une initiative de l'État ; celui-ci impose aux particuliers la constitution d'un syndicat qui décidera à la majorité et à frais communs, des travaux à effectuer ; les règles juridiques sont en l'espèce écrites, détaillées et approuvées par les pouvoirs publics.

[4] L'examen du régime juridique de la digue permettra au géographe de préciser, d'expliquer certaines particularités du tracé ou de l'aspect extérieur de l'ouvrage ; la digue sera plus grande, si l'État a fourni une subvention ou a forcé

5° Un aqueduc privé, nécessaire à l'irrigation d'une propriété particulière, ou un chemin privé traversant le sol du voisin [1] expriment l'existence d'une servitude, c'est-à-dire d'un droit réel qui permet au propriétaire d'un terrain d'utiliser à des fins limitées l'héritage voisin [2].

6° La clôture des champs par des haies ou des fossés ou des rejets de terre dont les formes si variées intriguent le géographe (témoin la question des rideaux picards, sur laquelle nous aurons l'occasion de revenir), la clôture des jardins, des vergers, des cours attenant aux bâtiments par des murs, voilà toute une matière réglée par d'anciennes coutumes et reprises par les Codes modernes [3].

7° Tous les réseaux d'électrification rurale, les lignes de transport de la force électrique, les routes grandes et petites, les voies ferrées et leurs ouvrages d'art, les conduites qui captent la houille blanche en haute montagne, les usines hydro-électriques, les barrages pour l'électricité, pour l'alimentation des villes en eau potable ou pour la régularisation du cours des rivières, toutes les installations nécessaires à la navigation des

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les riverains à contribuer au travail, par exemple ; la digue sera plus droite, son dessin plus logique et plus adapté au terrain si le travail a été déclaré d'utilité publique par l'État : les procédés de l'expropriation ont permis de faire passer l'ouvrage aux endroits optima, sans se soucier des oppositions de propriétaires riverains.

[1] Le propriétaire d'un champ enclavé peut imposer à son voisin le passage d'un chemin dont la nécessité est évidente (ce droit de passage est réglé en France par les articles 682 à 685 du Code civil, modifiés par une loi du 20 août 1881).

[2] Cette forme d'entr'aide rurale que constitue la servitude est vieille comme le monde, du moins comme le monde juridique, comme la propriété individuelle ; malgré leur conception absolue du droit de propiété, les Romains ont admis les servitudes rurales dès les origines de leur droit, au prix d'artifices de raisonnement variés (voir Raymond Monier, *Droit romain*, Paris 1943, t. I, p. 434, 4e éd.).

[3] Le Code civil consacre 21 articles (653 à 673) au mur et au fossé mitoyens : ces articles contiennent une description des formes caractéristiques de mitoyenneté, les règles de l'établissement du mur à frais communs, de son entretien.

rivières sont autant de formes du progrès technique appliqué au bien-être de l'homme ou servant à la production des richesses industrielles.

Toutes ces installations modifient le paysage rural, au point de le défigurer même, dans le voisinage des grandes villes.

Dans ce domaine de l'énergie et des communications, le droit, public et privé, intervient d'une manière analogue à celle rencontrée pour les digues ; plus l'œuvre est importante, plus le droit public s'impose et facilite la réalisation.

Ici encore, il ne viendrait à l'esprit de personne de dire qu'un ouvrage d'art, une installation technique modifiant le paysage naturel ont une origine juridique : c'est la satisfaction d'un besoin humain par un procédé technique nouveau qui est la cause de la modification du paysage ; mais les procédés juridiques, nécessaires à la réalisation du projet technique, expliquent bien des formes de détail qui intriguent à bon droit le géographe [1].

Utilisation de données juridiques pour rendre compte d'un grand nombre de formes de détail de la géographie humaine, voici la conclusion d'une étude que nous avons limitée au paysage rural [2].

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[1] Par exemple, l'ampleur que revêt en France toute installation hydro-électrique s'explique par la loi du 16 octobre 1919 qui donne à l'État une sorte de Droit éminent sur les chutes d'eau : il préfèrera, dans ces conditions, utiliser à plein la puissance naturelle de l'eau, au moyen d'entreprises importantes, qui relèveront en général du Droit public. — De même, il est impossible de ne pas être frappé par le tracé sinueux de beaucoup de grandes routes françaises, dans des pays plats et découverts : ces sinuosités s'expliquent le plus souvent par un défaut de la procédure d'expropriation en vigueur à l'époque où la route a été tracée.

[2] L'influence du juridique sur les formes du paysage urbain ou industriel est encore plus évidente : autant que les conceptions artistiques et les nécessités économiques, les Codes, les lois dirigent la croissance des villes : une cité est limitée en hauteur par des règlements de construction ; la largeur de ses rues exprime les détails d'un plan d'alignement ou d'aménagement, directives administratives, plus fortes que la volonté des particuliers, et dictées par un souci d'urbanisme ou d'hygiène. Les façades elles-mêmes trahissent le désir d'échapper à certaines taxes, redoutables à telle ou telle époque (taxe sur les portes et fenêtres, sur les balcons).

II

Étant admis le caractère utilisable du droit au profit du géographe, se pose maintenant le problème de la meilleure méthode à préconiser pour cette mise à contribution du droit.

Une première méthode serait pour le géographe d'acquérir une culture juridique suffisante ; de rechercher ensuite lui-même, à l'occasion de ses travaux géographiques, les explications juridiques de certaines formes du paysage.

Méthode à rejeter : d'abord, parce qu'elle contredit le principe que chaque chercheur a intérêt à se spécialiser dans la science qu'il étudie [1].

Ensuite, parce que la connaissance d'une science dont les affinités avec la sociologie sont indéniables risquerait d'écarter le géographe de l'objet essentiel de la géographie : étude des formes du paysage, accompagnée de l'analyse de ces formes, de leur classification, de leur comparaison avec des formes différentes, ou semblables, de l'explication des origines morphologiques au moyen de références à des sciences auxiliaires de la géographie [2].

Dans l'intérêt même de leur science, il semble que les géographes aient intérêt à lui conserver toute sa pureté, toute la simplicité apparente de son objet ; nous avons vu la crise traversée par la géographie à la suite des publications de Ratzel, qui, au fond, avait voulu, comme géographe, étudier l'origine des sociétés humaines.

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[1] Le Droit est une Science ardue ; la connaissance des textes législatifs, des Codes n'est pas suffisante ; pour connaître véritablement un point quelconque du Droit, il faut également savoir comment les Tribunaux interprètent la règle législative. Une connaissance sommaire du Droit n'est pas d'une grande utilité. — Comment un géographe pourrait-il devenir un juriste assez formé pour résoudre avec certitude et par lui-même les problèmes rencontrés?

[2] Toute Science peut devenir auxiliaire de la Géographie ; nous en avons énuméré un certain nombre, au début de cette étude, dont l'utilisation est plus fréquente (géologie, météorologie, scieñce politique ou sociale) ; la liste ne sera jamais close ; mais les géographes ont le tort d'utiliser eux-mêmes ces sciences auxiliaires.

Une autre méthode — bien préférable à notre sens — serait celle de la mise à contribution du juriste par le géographe.

Une telle méthode serait caractérisée par le principe suivant : soumettre à un juriste les points particuliers d'une étude, chaque fois que le géographe pense qu'une explication juridique n'est pas à rejeter.

Il semble que deux procédés permettraient d'assurer la mise à contribution du droit au profit de la géographie : la méthode du questionnaire [1] et celle de l'étude en commun [2].

Il appartiendra aux géographes de répondre eux-mêmes aux différents problèmes que posent les rapports de la géographie avec le droit.

Certes, ils pourront penser qu'il serait souhaitable de traiter personnellement tous les problèmes et de donner les explications juridiques nécessaires le cas échéant ; nous pensons avoir suffisamment dégagé les dangers d'une semblable politique d'annexion.

L'étude, l'analyse, la classification des formes du terrain paraissent donner à la géographie un champ d'étude assez vaste ; est-il vraiment nécessaire de prétendre à un monopole d'interprétation des formes analysées, quelle que soit la science qui fournisse l'explication la plus plausible?

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[1] Les questionnaires sont largement utilisés par les Juristes de l'Institut de Droit comparé de l'Université de Paris, lorsqu'ils veulent se documenter, au cours d'une étude, sur un point particulier d'une législation étrangère. Cette méthode donne de bons résultats (à condition que les questions soient précises et qu'elles appellent des réponses brèves) ; c'est la seule manière de travailler à distance, lorsque les deux antagonistes ne peuvent se rencontrer.

[2] L'étude en commun d'une question géographique, sous la direction d'un géographe, serait particulièrement recommandable lorsque le problème gagnerait à être étudié par des juristes spécialisés dans des branches du Droit différentes (nous avons vu, par exemple, que les grands travaux publics posent à la fois des problèmes de Droit public et de Droit privé) ; ou lorsque l'assistance d'autres spécialistes paraît souhaitable (ingénieurs, agronomes) ; — signalons à ce propos la récente création à Paris d'un Comité de Géographie appliquée, sous le patronage de la Fondation nationale des Sciences politiques et sous l'impulsion de M. Jean Gottmann ; le but essentiel de ce Comité paraît bien de mener de telles études en commun et, notamment, d'exploiter le Droit au profit de la Géographie.

Il serait en tout cas souhaitable qu'un conflit de compétence ne retarde point la prise de contact qui s'impose entre le droit et la géographie : la géographie trouverait dans cette coopération l'explication de nombreux problèmes qui l'intéressent [1].

Il apparaît, au surplus, certain que la science géographique ne peut que gagner en s'engageant résolument dans une voie de synthèse ou de coopération scientifique ; ne fournit-elle pas aux sciences auxiliaires qui lui sont utiles la plus solide base de discussion : le *Sol*, avec ses différents aspects visibles, tangibles? D'autres sciences, rivales de la géographie

[1] Les rideaux picards offrent un bon exemple d'une question apparemment au point, dans l'état actuel de la Science géographique. L. Aufrère (*Les rideaux, Ann. de Géographie,* 1929, p. 529, Paris) a montré sans réplique possible que les rideaux avaient une origine humaine (et non pas physique, comme le soutenaient certains géographes) ; la démonstration de L. Aufrère s'appuie largement sur des éléments juridiques, spécialement sur l'évolution de la propriété et le cadastre ; cette étude conduit à la conclusion suivante : 1° un rideau est une ligne de clôture, établie par deux propriétaires voisins à flanc de côteau et entretenue à frais communs, suivant des règles coutumières ; 2° cet accident de terrain est en relation certaine avec le labourage, peut-être avec la forme des charrues.

Il ne nous paraît pas douteux qu'un géographe, reprenant cette étude sur un cas concret, et soumettant les résultats de son analyse morphologique à un agronome et à un juriste, aurait des résultats très intéressants. Il constaterait sans doute que la part du droit dans la genèse des rideaux est exagérée par l'étude d'Aufrère ; qu'il existe des rideaux établis sans rapport avec les limites de propriété ; que les rideaux marquent simplement un morcellement dans les labours (lequel morcellement résulte aussi bien de l'assolement, de la différence des cultures que de la différence de propriété). L'agronome répèterait au géographe cette vérité qu'aucun paysan n'ignore et qui veut que la charrue conduise insensiblement dans le fond de la vallée toute la terre arable des versants (conséquence inévitable de la pesanteur : dès que la pente est assez forte, le laboureur doit rejeter la terre qu'il détache du sillon en contre-bas de ce dernier) ; le rideau (pour le juriste comme pour l'agriculteur) prendrait l'allure d'un phénomène imposé à l'homme par la technique agricole et non pas voulu par l'homme.

Il est probable que le géographe conclurait, dans ces conditions, au caractère accidentel des rideaux ; le rideau est un accident, une anomalie dans cette érosion humaine que produit le travail du laboureur (érosion qui explique sans doute pourquoi beaucoup de vallées de montagne sont dominées par des pentes, hier cultivées, aujourd'hui incultes).

dans une certaine mesure, se prêteraient moins à une étude d'ensemble [1].

En conclusion, il faut souhaiter que le mouvement des juristes de se rapprocher des géographes reçoive un accueil favorable de ces derniers.

Une nation comme l'Égypte se devrait de prendre une part importante dans ce rapprochement scientifique :

Une terre, riche d'histoire et marquée par des civilisations fameuses.

Un important milieu rural, avec ses traditions.

Des règles juridiques variées et complexes.

Autant d'éléments que les géographes égyptiens pourraient utiliser dans un travail de synthèse, avec une collaboration que les juristes d'Égypte ne leur refuseraient certainement pas.

[1] La notion de classe sociale, de groupe social est infiniment plus difficile à préciser (dans la sociologie) que l'objet de l'étude géographique ; la difficulté des mesures démographiques rendrait également difficile une étude collective des problèmes sociaux.

DESICCATION IN EGYPT

BY

G. W. MURRAY.

In the deserts of Egypt, an observer is not infrequently confronted with two sets of evidence, at first sight conflicting; the one proving the cessation of regular rainfall for at least 5000 years; the other affirming a more recent existence of, not only fauna and flora, but of human habitation as well. It is with a view to reconciling these apparent discrepancies that this article has been written. But, before drawing his own conclusions, the writer will present sufficient evidence to enable the reader to form his own opinion.

I. *Evidence of a general desiccation since the Pliocene Age.*—Desert[1] conditions have undoubtedly prevailed over the Egyptian corner of Africa for the latter half of the immense period, perhaps a million years, which has elapsed since the close of the Pliocene; during which the oases and the deep Qattara depression were being hollowed out by the wind. Particularly has this been the case with the country west of the Nile. In contrast to the desert east of the river, which has been sculptured in bold relief by former rivers heading in the Red Sea hills, the Western desert, below the 400 m. contour, consists of an infinite number of shallow depressions without outlets; of which, a few, here and there, have been excavated by wind erosion down to the subterranean water-level and in which, consequently, life is possible. Such rare exceptions are the well-known oases.

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[1] I accept the definition of a "desert locality" as "one where the rate of soil erosion exceeds the rate of soil deposition"; given by V. Bosazza in *Nature*, April 5, 1947.

From this absence of a general surface drainage system one may fairly infer an almost entirely rainless climate over a long period—a period sufficient for wind erosion to have removed all traces of a former erosion by rain. Over the surface of this dimpled rocky plateau are ruled parallel lines of dunes of blown sand, some hundred of miles in length, whose "tails" (if I may call them so), seem to be fixed, while the heads grow by accretion. They increase at the modest rate of twenty metres or less a year[1]; and many thousands of years without rain must be allowed for their formation.

Another noteworthy piece of evidence lies in the depths of the Qattara depression where a great platform of rock salt has been exposed by aerial denudation and constitutes the protective cap of a plateau at the—70 metre level, which stands beside a salt marsh at—120 metres. Had there been any considerable rainfall at any time during the period necessary for the erosive forces to deepen the Qattara depression by these 50 metres—a very considerable period—this cap of rock salt must have been dissolved and the plateau denuded down to accord with the general level of the floor of the depression.

There is another witness to the absence of recent fluvial erosion in the Libyan desert, even though it proves that it did once exist. The limestone plateau whose bold escarpment bounds the Nile Valley on the west between Asyut and Aswan, attains an elevation of 500 metres and the former watercourses, descending from it to the north and east, were thus given sufficient impetus to erode their channels in the plain below and reach the main drainage channel of the country, now occupied by the Nile.

One of these former Libyan tributaries, the Wadi Kubbaniya, empties itself into the Nile about fifteen kilometres north of Aswan, just opposite the mouth of a similar wadi, that of Abu Sibeira, coming from the east. Both these ancient river estuaries are now choked for many kilometres by an immense deposit of silt, thirty metres deep at their mouths, which the Nile began to bring down from the Sudan in late palaeolithic times (about 12,000 B. C.) and which chokes, not only these wadi-mouths but spreads out over a wide plain to the east of Kom Ombo. From

[1] The Qattaniya dune near Cairo advanced 84 metres between 1926 and 1933.

artifacts found in these silts at Sebil near Kom Ombo, the prehistorians have named these silts "Sebilian".

The cases of the two dead rivers I have just mentioned are very different. Whereas the eastern, the Wadi Abu Sibeira, revived from time to time by freshets from the mountains to the east, has been able to re-cut its old river channel through the Sebilian silts, the Wadi Kubbaniya, coming from the west, has never received sufficient rainfall to enable it to do so; and there are now some 4000 feddans of cultivable land filling its ancient bed from side to side and awaiting irrigation by the pumps which the new Aswan hydro-electric scheme is expected to make shortly available.

II. *Evidence of a rainy interlude terminating about* 4000 *B. C.*—Yet, though desert conditions have prevailed in Egypt as a rule since the close of the Pliocene, there have been, exceptionally, long rainy intervals (whose correlation with the glacial periods of Europe attracts and repels the attention of the prehistorians) [1], during which palaeolithic hunters and shepherds roamed the steppes of what is now the Sahara. Evidence from Palestine, the Sudan and Uganda [2] suggests that the latest of these intervals took place there as late as 5000-3000 B. C.; while, in Egypt, there may have been a corresponding amelioration in the climate in early predynastic times.

During these interludes the Red Sea hills do not seem to have been glaciated, but they received an abundant rainfall and the desert between them and the Nile was drained by a system of watercourses, whose terraces record changes of level and slope in the main river channel which traverses the country. There flowed therein a torrent larger and certainly more rapid than the present Nile until about 8000 B. C., its slope gradually diminished and, instead of transporting gravel, it began to deposit in Upper Egypt a fine Abyssinian silt on which, later, agriculture became possible.

[1] C. E. P. Brooks considers in *Climate through the Ages,* 73-74, that, during the glacial periods, there may have been less precipitation over Abyssinia and a smaller Nile.

[2] Summarized by J. D. Tothill in *The Origin of the Sudan Gezira Clay Plain,* in *Sudan Notes and Records,* XXVII, 1946.

During this interlude, the climate of Northern Egypt, east of the Nile, may be presumed to have resembled that of present-day Palestine; as on the 1500 m. high plateaux of the Galala mountains a few terebinth trees survive to remind us. East of the river, the aspect of the plains between the sea and the Qattara depression must have been that of modern Cyrenaica. Farther to the south, the rainfall was insufficient either to dissolve the rock-salt in the depression or to enable the Wadi Kubbaniya to re-cut its ancient course. In the south-east, the mountains were no doubt wooded like those of Elba and the Kassala Province of the Sudan. The streams which descended from them may have contained fish [1]. The plains in the far south-west were like those of Kordofan today and, over them, the hunters chased the ostrich, the giraffe and, perhaps, the elephant [2].

Vestiges of that bygone age when vegetation flourished on the hill-sides as well as in the wadi-floors of the Eastern desert may be seen very commonly on gravel-covered foot-hills whose flanks are often striated with a network of trails left by grazing animals; though the grasses and shrubs on which they grazed have long vanished with the animals themselves from the face of the desert.

The abundant flint and quartzite implements which still lie scattered over the desert are, for the most part, relics of the earlier pluvial interludes; but remains of the last have survived. In the great Wadi Qena, as in some of the greater wadis of Algeria, the lowest terrace of all is covered with the trunks of dead tamarisks and mounds of humus which neither the wind nor the rare floods have, as yet, been able to carry away. Shells of the snails which lived on the former vegetation may be picked up over a wide area in the Eastern Desert. I have collected *Zootecus insularis,* the "dirs el aguz" of the Ababda, from Wadi Saqi', Wadi Barud and Wadi Abu Sibeira and *Pila obovata* from Wadi Gabgaba on the Sudan frontier.

[1] The 1938 Bagnold expedition to the Gilf Kebir found bones of fish in the dried-up lake beds; and there are small fish, *Cyprinodon dispar,* in the Khor Arba'at, the source of the Port Sudan water supply.

[2] The 1933 Bagnold expedition found the bones of a large pachyderm near "Yerguehda Hill" in latitude 21°, to the south of 'Uweinat.

In the Western Desert, within the Qattara depression, dead tamarisks are common enough. But, there the wind has generally removed the humus. Though beyond the reach of the camel caravans, these trunks extend an obvious invitation to the motorist in search of firewood and so it will not be long before they too have vanished from the face of the desert. To an European reader, it may seem difficult to believe that tree trunks could lie on the desert for 6000 years without being disturbed. Yet, if he reads on, he will see that articles, which can be dated accurately to 5000 years ago, have been picked up unaltered by the passage of time from the surface of the Nubian desert, so that he is only being asked to extend a farther antiquity of a thousand years to these tamarisk trunks.

Tree roots were found in abundance in a terrace, 12 metres above the present Nile cultivation, along the east bank of the Nile between Deir Tasa and Khawalid, opposite Abu Tig. They were proved to be older than the Old Kingdom and Mr. Guy Brunton [1] thought them contemporaneous with his "Badarian" people. If he was correct in this, then the cessation of rainfall may be correlated with the passage from the early to the later predynastic culture and for that, an approximate date of about 4000 B. C. fits well enough.

Similar tree roots were found above Nile level at Dakka in Lower Nubia by the Archaeological Survey of Nubia [2]; but, at Dakka, there is an influx of artesian water into the Nile and it is unnecessary to postulate a former rainfall to account for these.

Among the early rock-drawings on the sandstone rocks, both east and west of the Nile, there are some which have weathered right back to the same black patina which covers the rest of the surface, out of which they were originally hammered. Dynastic rock-drawings seem today almost as sharp and fresh as on the day when they were cut; so, in this differential weathering, it is difficult not to read evidence of a former rainier period and to believe that these blacker drawings date back to the earliest predynastic or the neolithic period.

[1] *Mustagedda,* 67-68.

[2] Personal communication from Dr. D. E. Derry.

About 4000 B. C. the situation was therefore this ; in the main drainage channel of the country, the Nile was depositing the fine black silt which it had begun to bring down four thousand years before ; but the other watercourses of the desert had degenerated into wadis which only occasionally ran with water after rain. Regular rain had ceased, the wind had resumed its fretting of the uplands and the hunters and shepherds, by now in a "predynastic" stage of culture, shrank into confinement in the Nile Valley and the oases—except for a few conservatives who preferred poverty and liberty in the Red Sea Hills, where they still remain, and in the Gilf Kebir, from which they did not vanish till the time of the Sixth Dynasty. In the oases, the rain-fed springs of the escarpments dried up and were covered by drift sand.

III. *Evidence of no rainfall in Lower Nubia since 3500 B. C.*—As one approaches historic times, the evidence for no rainfall in Lower Nubia becomes clear enough. There, the remarkable state of preservation of the predynastic bodies found by the Archaeological Survey of Nubia in 1907-1908 buried in the sand just above the First Cataract without any dehydrating material, seems to justify a conclusion that there has been no continuous rain in that region since early predynastic times. To quote the report of that season on the human remains by Professor Wood Jones [1] :

"In the case of the bodies of the later Predynastic and early Dynastic periods we were, however, more fortunate and, among the large group of burials of those dates, there were many instances of truly wonderful preservation of the body. The reason for the extraordinary perfection of these bodies is the fact that they were buried in shallow graves in the hot dry sand ; air was in great part excluded from them ; moisture did not reach them ; and they became simply dried up and naturally preserved ... The preservation of the tissues of the eye calls for special mention, for it is a remarkable thing that so delicate a structure as the eye should remain at all after a lapse of four or five thousand years. Yet, not only does the eye remain, but every detail of its gross anatomy can

[1] *Archaeological Survey of Nubia Report,* 1907-1908, II, 189-190.

be identified in a dried and shrunken condition... In the majority of the bodies in which the brain is not tampered with (*i.e.* no attempt has been made to clear out the cranial cavity), it is found today as a hardened and shrunken mass which represents in perfect miniature every sulcus and convolution of the fresh brain".

It is surely clear from the above remarks that moisture had never penetrated the sand—a very permeable medium—since the earliest bodies had been buried just before the First Dynasty, about 3500 B. C.

If further evidence were wanted, it is supplied by the fact that, in 1938, when exploring the "Chephren quarries", 60 kilometres north-west of Abu Simbil, my wife picked up *from the surface* a copper crowbar or "gad", in perfect preservation and brownish-red in colour [1], which, from an inscription on it Mr. Alan Rowe has dated to the period of the Old Kingdom [2]. Not a mile away, a stela of Khufu (2900 B. C.) was found standing and unweathered. Had there been any moisture or any great wind erosion there during the last 5000 years, these exposed objects would certainly have shown some sign of damage by them.

These quarries seem to have been abandoned after Old Kingdom times, perhaps owing to the failure of the wells near them [3], though the amethyst mine, ten kilometres to the north, was worked certainly during the Middle Kingdom and, perhaps, later.

IV. *Evidence of habitation in the Western desert down to First Dynasty times.*—It might seem, therefore, that the case for no rainfall in Lower Nubia during the historic period had been amply proved and that it would be a waste of time to go on discussing the matter. Yet, there is a considerable amount of, at first sight, contradictory evidence that this very Nubian desert was still inhabited down to the time of the First Dynasty. During his expedition along the southern border of Egypt

[1] It has since gone green in the damper atmosphere of the Cairo Museum where it is wrongly described as a "chisel".

[2] A. Rowe, *Provisional Notes on the Old Kingdom Inscriptions from the Diorite Quarries. Annales du Service,* XXXVIII, 1939.

[3] G. W. Murray, *The Road to Chephren's Quarries,* G. J. Aug. 1939.

in 1930-1931, Mr. (now Col.) P. A. Clayton [1] discovered eight ancient sites, the *trouvaille* from which was dated by the Rev. Père Bovier Lapierre generally as "predynastic", though there were two curious pottery disks as to whose date he ventured no conjecture. Such disks occur over a wide area in the deserts, both east and west of the Nile, and have later been found associated with pottery of the First or Second Dynasty [2].

These finds by Col. Clayton prove human occupation over a very wide district, now utterly uninhabited, round the present wells of El-Shab and Tarfawi; and one must suppose that this area was inhabited for some centuries after the cessation of rainfall and was finally abandoned owing to the undoubted great fall in the subterranean water table which has occured there.

The high ground, above 600 metres, below the cliffs of the Gilf Kebir was certainly inhabited by people of the "C-group" culture and may not have been finally deserted till about 1500-2000 B. C. [3].

V. *The Subterranean Water Table beneath the Western desert and its fall.*— The existence of a subterranean water table, fed by the rains of Central Africa, beneath the surface of the Western or "Libyan" Desert was postulated by the late Dr. John Ball more than twenty years ago [4]; and such additional evidence as has accumulated since then has modified the underground water contours he drew on his map but has not invalidated his main hypothesis. The case for a general water table beneath the Western desert may be taken as proved; and there is some reason to think that, as he surmised, a similar water table may exist beneath the Eastern desert also. Both these water tables stood at higher levels in the past.

For, in 1928, during the sinking of Bir el-Misaha, 370 kilometres west of Wadi Halfa, the late Mr. Beadnell recorded "wet rock" at 45

(1) P. A. Clayton, *The South-western Desert Survey Expedition, 1930-1931, Bull. Soc. Roy. de Géogr. d'Égypte,* XIX, 254-265.

(2) G. W. Murray, *An Archaic Hut in Wadi Umm Sidrah, JEA,* XXV, 1939.

(3) R. A. Bagnold and others. *An Expedition to the Gilf Kebir and 'Uweinat,* 1938. G. J. April, 1939.

(4) J. Ball, *Problems of the Libyan Desert,* G. J. July, Aug. and Sept., 1927.

metres down and, at 45 metres, "water expected within a metre" [1]. This encouraging dampness continued, yet the actual water level was not reached until he had deepened his well to 67 metres; nor did the water then rise in the shaft. The dampness can only be explained by supposing that, at some former period, the subterranean water had stood higher by 22 metres than it does today; and that former period may have been very long ago; for wetted sandstone, 45 metres down and unaffected by evaporation, might retain its moisture for hundreds or even thousands of years.

Why has there been this drop in the subterranean water table? Beadnell's explanation [2] is partially correct; that it has been caused by the incessant and increasing withdrawals of immense quantities of water for the irrigation of the great oases of El-Kharga and el-Dakhla. Another source of leakage is that, as pointed out by Ball [3], this subterranean water table is cut through at the 100 metre level by the Nile at Dakka, where considerable quantities of warm water are seeping into the river on both banks. Downstream of Dakka, these water-logged beds must be suffering a slow but steady loss to the Nile. (But, the raising of the water-level in the Aswan Reservoir to 123 m. must have resulted in the restoration of great quantities of water to these beds during the annual periods when the reservoir is full.)

Could one reverse the flow of time and restore gradually the ancient water level, one would see the present shallow wells at El-Shab and Tarfawi expand into small lakes (like the one at Kufra), round whose shores would stretch flourishing oases, inhabited by the Temehu or Southern Libyans (Reisner's C-group?), with their flocks and herds. And it would, of course, have been correspondingly easier, by 22 metres or so, to reach water in the wells near the Chephren quarries. The influx of warm water into the Nile at Dakka, mentioned by Ball, would have taken place at a higher level and the presence there of tree roots, observed by Dr. Derry, explained thereby.

(1) Unpublished report on the sinking of Bir el-Misaha.

(2) H. J. Ll. Beadnell, *An Egyptian Oasis,* 140.

(3) Ball, *op. cit.,* 112-113. The static water level of 100 m. is that of the Nile the water-logged beds on either side must be conjectured to lie somewhat higher.

This fall in the water table has been observed also in the Sudan; in Dar Fur, it has led to the abandonment of Kobé, the ancient capital; while, at Bir el-Atrun and Merga, there is evidence of a former higher water level by about 10 metres [1].

VI. *Desiccation and a fall in the water Table in the Eastern desert.*—After the cessation of regular rainfall, the present condition of total aridity in Upper Egypt [2] would not be arrived at for some time. The larger desert trees, acacias, tamarisks, *Balanites,* dom palms would obtain sufficient moisture from the air to live, but their seeds could not mature. The wind would not remove the humus all at once. The subsoil water level would sink very slowly. In the foothills the rain would continue after it has ceased in the plains.

Thus, at Megwel Eir Arib, at an altitude of 509 m., below the high mountain mass of Gebel Garf, a cemetery of cattle was found on a site where no cattle could live today; which was dated, on the authority of a single potsherd, to the C-group period, say 2500-2000 B. C.

The underground water supplies in the Eastern Desert are threefold.

1. Besides the influx of warm water from the east bank into the Nile at Dakka, Dr. Ball cited also the occurrence of abundant water at the 122 metres level at Laqeita, 32 kilometres east of Qift to support his theme that the general water table beneath the Western Desert extended below the Eastern Desert also [3]. He might have added that, after deepening the ancient well at El-Kanayis, 45 kilometres east of Idfu, in 1905, the water rose 13 metres in the shaft to 133 metres above sea-level; a circumstance which certainly points to the supply there coming from some source other than that of the water seeping down the course of Wadi 'Abad.

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[1] K. S. Sandford. *Observations on the Distribution of Land and Freshwater Mollusca in the Southern Libyan Desert, QJGS,* XCII, 201-217, 1936.

[2] The total rainfall at Aswan during the years 1935-1948 has been only 29.3 mm.

[3] G. W. Murray, *Graves of Oxen in the Eastern Desert of Egypt, JEA,* Oct., 1926.

2. Besides this basic water table, which derives from Central African rain and which, owing to the rapid rise of the ground eastwards, can only be tapped near the Nile, there are everywhere seepages down the beds of the larger wadis which can be reached at no great depth and are, occasionally, brought to the surface by dykes.

3. Further, the whole desert received a thorough soaking in the Pliocene, if not during the rainy interludes, and it is probable that all this "fossil water" has not drained away yet. Here and there, some of it survives, in isolated water-bearing strata, preserved for us by the presence of clay or other impermeable beds beneath them.

Thus, the Roman well near the quarry settlement of Mons Claudianus, from which water was conducted by a pipe-line to Port Safaga during the last war, gave abundant supplies from a depth of 26 metres, though it is sunk in the small Wadi Umm Diqal with a catchment area of only 30 square kilometres in one of the most rainless districts in the Eastern Desert. Such a yield can only be explained by supposing that the well has tapped some source quite unconnected with surface relief; and this supposition is confirmed by the existence of the neighbouring large well of Bir 'Abd el-Wahhab, only a kilometre away in the Wadi Fatira el-Beida. Wadi Fatira el-Beida has certainly a larger catchment area; yet the whole area is so rainless that I believe that both these wells derive their supplies from "fossil water"; that is, water locked up in the rocks since the last pluvial period, a good many thousand years ago.

Most of these subterranean "aquifers"; vestiges of a general subsoil water table of a remote past have been gradually drained of their contents naturally through fissures or at points where wadis, in deepening their beds, have cut down to them, or by artificial wells. Some are still yielding water, as those cited above and those at Kurkur and Dunqul in the Western Desert. Some, no doubt, still exist untapped—pleasant surprises for the well sinkers of the future.

One of these was found in 1912, when phosphate mining began at Umm Huetat, the great mine whose produce is shipped from Port Safaga, where the phosphate beds were found to be water-logged. In this mine the level of the underground water has been lowered by pumping some

12 metres in the last 35 years. The excess water runs away down the Wadi Gasus; and it is probable that, at a former period, this wadi has eaten into and removed some of this underground store. For there are ruined houses and gardens, the remains of a Ptolemaic colony, farther down the wadi, nearer the sea.

Again, at the Umm Qareiyat mine in the Wadi al-'Allaqi, the ancient Egyptian workings for gold stop abruptly at a level which the modern miners thought to represent a former water table 7.5 metres above the present one [1].

VII. *Lack of Rain in the Nile Valley during the historic period.*—Herodotus records it as a marvel that it rained in Upper Egypt in his time. But there has always been the risk of an occasional downpour there; and, to lead the water of these downpours away from the roofs of their temples, the ancients took many precautions. Engelbach and Somers Clarke remark [2] :

"In contrast to his lack of care for foundations the Egyptian took great pains in dealing with the problem of rain. His paints were fairly water-proof and the infrequent rain against the painted surface of the outside of a temple would do no very great harm. Inside, it was far otherwise; rain flowing on the roof collects all the mud and dust which have become deposited on it, and the effect of water with mud in suspension pouring down a painted surface can well be imagined, especially when it has dried on. In temples, therefore, many more or less ingenious means were employed whereby the joints between successive roof-slabs were made rain-proof and the water led off towards spouts which threw it clear of the temple walls".

But there was really very little rain may be inferred from their further statement [3] :

"This form of roofing is seen in some of the IIIrd and IVth dynasty mastabas at Saqqara and Giza and it also appears in the newly discovered chapels of the time of King Zoser (2940 B. C.) Such a series of blocks

(1) W. F. Hume, *Geology of Egypt*, II, 752.
(2) *Ancient Egyptian Masonry*, 154.
(3) *Op. cit.*, 7.

has the disadvantage of offering many opportunities for rain to enter; though it must be admitted that in the Zoser masonry the good condition of the paint on the under side of these stone "logs" shows that very little rain actually did come through".

VIII. *Possible Recrudescence of Rainfall in the Faiyum during the Old Kingdom.* (3000-2500 *B. C.*).—The prehistory of the Faiyum has been studied in great detail by Miss Caton-Thompson and Miss E. W. Gardner who, after inferring that the gradually increasing dryness of the climate in Neolithic times caused an abandonment of agriculture before 4500 B. C., suppose that there was a recrudescence of rainfall in the early dynastic period. Believing that the lake had an existence independent of the Nile so late as the time of the Old Kingdom, they say [1] :

"Cumulative evidence would appear to be conclusive concerning the somewhat higher rainfall of this angle of north-east Africa as late as he Old Kingdom. Not only in the Fayum does the formation of the great beach deposit at A. L. 140 (R. L. - 7 feet) indicate prolonged equilibrium between the evaporation and rainfall but hieroglyphic record asserts that the north-western Delta and the now desert region to the west of it, Tehenu-Land, was, as late as the time of the Old Kingdom, capable of supporting large herds of cattle".

Dr. Ball, however, considered [2] that the Faiyum lake was fed from the Nile and that, consequently, there was no need to postulate rainfall in the Faiyum in the days of the Old Kingdom. The above authors themselves, in another place, doubt any continuous rainfall [3].

"Though this greater rainfall seems indisputable yet there is one feature common to all the late faunas that make one hesitate to postulate extreme or continuous, as opposed to spasmodic, rainfall in the Fayum. That is, the astonishing fact that no single land shell has been found in all the hundreds of faunas collected... The only explanation that suggests itself is that land shells were not living near the lake margins

(1) *The Desert Fayum*, 96.
(2) *Contributions to the Geography of Egypt*, 197-199.
(3) *The Desert Fayum*, 17.

and that, even if they occurred at some distance from it—as *Helix desertorum* does at the present day—there was never sufficient run-off to carry them into the lake. In either case, the conclusion is the same; namely that there was never enough rain to give rise to a continuous carpet of vegetation in which land shells could thrive or to cause the drainage to anything but short and intermittent."

We may therefore regard the case for an increase in the rainfall in the Faiyum in early dynastic times as "not proven".

IX. *Extension of the Mediterranean Rain-Belt southwards in Græco-Roman times;* 500 *B. C.* - *A. D.* 500.—As regards the Mediterranean coast, Dr. Ball remarks [1] that "the dunes from which the deposits originated were formed in the late Sebilian period, that is, roughly between 12,000 and 10,000 B. C. and that the climate of the Mediterranean coast of Egypt was at that time even less moist than it is at the present day". Under the relatively settled conditions of classic times, cisterns were dug and kept clear of silt along the whole littoral west of Alexandria. Vines, figs and olives were cultivated and, though the struggle must have been a hard one, the country was inhabited. But the Arab invasions and the insecure rule of the mediæval Sultans soon brought about the abandonment of cultivation throughout the once fertile Maryut. The cisterns gradually silted up with the wash from the winter rains; for nobody was going to clear, say, 1000 tons of silt out of a cistern to which his title was not secure. Only within the last twenty years has the process been reversed and fruit cultivation restarted in a tentative manner.

Indeed, the existence of these 2000 odd cisterns between Alexandria and Sallum, already hollowed out in the millennium before Christ, proves that the ancients were anxious to conserve a rainfall probably as scanty as that of today. A weather diary, kept by Claudius Ptolemaeus [2], shows that, in the second century A. D., the number of rainy days *per annum* was much the same as it is nowadays, though the rainfall was

[1] *Contributions,* 31.

[2] G. Hellmann, *Über die ägyptisches Witterungsangaben im Kalendar von Claudius Ptolemaus,* Sitzungsber. d. Kgl. Preuss. Akad. der Wiss., 1916, XIII.

more evenly spread out throughout the year. There is, however, evidence that the present very narrow belt of rainfall, which varies with latitude rather than with the irregularities of the coast line, did, in those days, extend a little farther inland. Ruins of a temple [1], 35 kilometres south of El-Dab'a and of a villa, 67 kilometres south of Marsa Baqqush, show this; and, in the ruins of the former, were found two small trunks of cedar and a number of acorns, though both the oak and the cedar are now extinct in Egypt [2].

X. *Recent shrinking of the Nile towards its central channels in the Delta.*—But the abandonment of cultivation in Maryut is not altogether due to cessation of rainfall. A tendency of the Nile water to concentrate itself on the more central branches of its delta has led, on the east, to the drying up of the former Pelusiac branch and the abandonment of Pelusium; while, in the west, Nile water no longer fills the lake of Maryut and that district is now dependent upon a capricious winter rainfall while the wells in the once populous city of St. Menas have long ceased to yield.

This shrinking of the Nile towards its central channels may, perhaps, be ascribed to the undoubted sinking of the coast of the northern Delta to the extent of about two and a half metres since classic times which has been observed both at Tanis and Alexandria [3]. The sea has, in consequence, invaded the land over wide stretches, notably in Lake Manzala. This recession of the Nile water has greatly intensified the effects of desiccation to the east and west of the Delta, but it has no connection with rainfall.

XI. *Man the Enemy of the desert fauna.*—Though the advance of desiccation has driven away the giraffe, the oryx, the wild ass and the ostrich to the south and caused, perhaps, the extermination of the stag, which

[1] G. W. Murray, *A small Temple in the Western Desert, JEA,* XVII, 1931.

[2] Theophrastus (370-285 B. C.) speaks in his *Enquiry into Plants,* 4. 2. 8 of the oak as common in the Thebaid.

[3] A repetition of the first order levelling between Cairo and Alexandria, now nearly forty years old, might show whether this drop of almost a millimetre a year in the northern coast is still going on.

disappeared in Middle Kingdom times, the final disappearance of many species must be set down to human agency. The wild boar and the addax have disappeared in our own days ; and the cheetah and the Barbary sheep have perhaps followed them. The ibex and the leopard (in Sinai) will soon fall victims to the rifle ; while the speed of the Dorcas and the Loder's gazelle will not long preserve them from the modern car. Man's ineradicable habit of hunting is about to render the Egyptian desert a completely empty waste.

XII. *Summary*.—After the last rainy interlude, which terminated about 4000 B. C., those inhabitants of the desert who did not invade the Nile Valley withdrew to higher ground in the south-west and south-east where they maintained themselves and their cattle till "C-group" times, perhaps 2500-2000 B. C. Water near the surface at El-Shab and Tarfawi permitted people to live there in oases till about 3000 B. C., when the fall in the water table rendered these places uninhabitable. There was a doubtful recrudescence of rainfall in the Faiyum in Old Kingdom times and, in the classic period, the Mediterranean rainfall moved a little farther south. That is the history of the Egyptian climate during the last eight thousand years.

THE BASEMENT ROCKS

OF THE

NORTHERN PART OF THE EASTERN DESERT

OF EGYPT

BY

H. M. E. SCHÜRMANN.

In the present paper a summary is given of my geological and petrological studies of the basement of northern Etbai, published in *Neues Jahrbuch für Mineralogie, Geologie und Paläontologie,* Teil I-XI. Important contributions to the knowledge of this area have been made by G. Andrew [1], J. Barthoux [2], M. Blackenhorn [3], W. F. Hume [4] and E. Krenkel [5]. Particularly exhaustive descriptions of the various basement rocks of Egypt, fully illustrated, are to be found in Hume's "Geology of Egypt", several volumes of which have already been published, while very valuable work on the chemical composition of the Egyptian igneous rocks has been done by Barthoux [2] and Harwood [6].

A. Geological outline.—In northern Etbai and in Sinai—a typical faulted region—the younger pre-Cambrian in particular outcrops several

[1] *Imperial Porphyry and Greywackes of Eastern Desert. Bulletin de l'Institut d'Égypte.*
[2] *Chronologie et description des Roches ignées du désert arabique. Mémoires* présentés à l'Institut d'Égypte.
[3] *Aegypten. Handbuch der regionalen Geologie.*
[4] *Geology of Egypt.*
[5] *Geologie Afrikas,* in "Geologie der Erde".
[6] *Geol. Mag.,* Vol. LXXII 1935.

thousand metres thick : the Dokhan-Hammamat-Ferani series, composed of mostly coarse sediments and conglomerates, but over large areas mainly consisting of thick deposits of tuffs and flows. The "essential contrast between the eruptivity of the early pre-Cambrian and post-Cambrian eruptivity" (R. A. Daly, 1933) is weakened by the occurrence of the Algonkian volcanic rocks of northern Etbai. Below the Dokhan-Hammamat-Ferani series follow gneisses and schists, which outcrop only sporadically in northern Etbai and which are generally more affected by tectonical movements than the younger Dokhan-Hammamat-Ferani series. It is of great interest that into this tectonically only slightly affected complex of the Dokhan-Hammamat series mighty granitic masses—partly pegmatic, without femic constituents—have intruded, which are therefore young pre-Cambrian and which are among the largest granitic masses in the world. These granitic plutonic masses—partly rich in alkali and mostly occurring unconformably—must be regarded (C. H. Smyth Jr., *The Genesis of Alkaline Rocks,* American Philosophical Society, Bd. 66, 1927) as belonging to the intrusions of the faulted mountains and the table-mountains (germanotype structure of Stille, 1939). Although according to Cloos (*Einführung in die Geologie,* 1936, p. 81) this type of plutonic masses is far rarer than and its structure is different from the intrusions of the folded and overthrust mountains, it should be pointed out that one of the largest igneous complex, the Bushfield, has been considered, also by Cloos and others, as belonging to the faulted mountains. Beside basic rocks this igneous intrusion has also produced enormous quantities of granitic rocks.

In the whole region of the Red Sea young pre-Cambrian plutonic masses—mostly rich in alkali—outcrop in the upper Algonkian Hammamat series to such an extent—28.000 square kilometres—as to indicate that, in general, plutonic masses of the faulted tectonics occur far more than has been hitherto assumed. Seeing that in northern Etbai no younger orogenesis has influenced the Algonkian beds, the basement rocks of the eastern desert with their imposing exposures are the very area to study the stratigraphical mutual relations of the younger pre-Cambrian, which are not obscured here by regional metamorphism.

Moreover, northern Etbai is an area in which pre-Cambrian granite

tectonics in the faulted mountains and also the association of the dike rocks can be pre-eminently studied; of the pre-Cambrian dike rocks of Etbai, rocks have already been widely known which, according to R. A. Daly, *Igneous rocks,* etc., 1933, p. 44, are still "very rare or quite

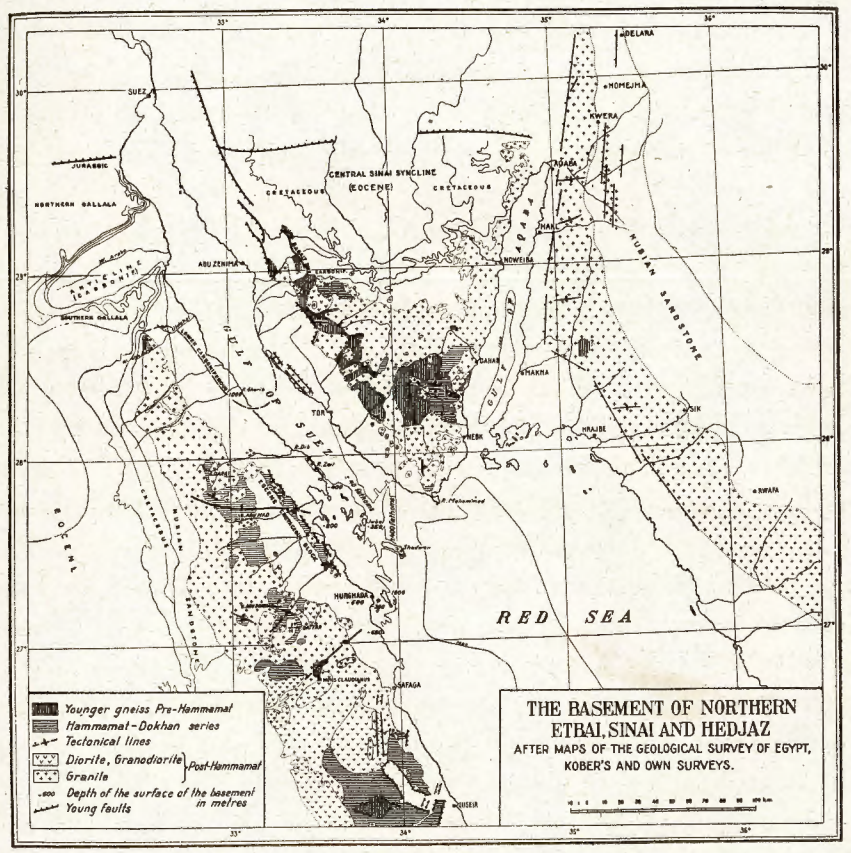


Fig. 1.

wanting in the pre-Cambrian". Northern Etbai contains many important localities of pre-Cambrian igneous rich in alkali (Na!), which does not support Daly's opinion of 1914 (*Igneous rocks,* p. 60) on the occurrence of alkali rocks. The Algonkian granitic intrusions have not taken place at great depth, as otherwise the Algonkian rocks containing these intrusions would have undergone more intensive metamorphism. Nor have these intrusions taken place under stress, as is proved by the tectonics of the

younger Algonkian. So there is a great difference between these Algonkian intrusives due to fault tectonics of germanotype structure and, for instance, the intrusive tectonics of the Alpine overthrust type.

Fig. 1 shows the basement rocks of the northern part of the Red Sea and its northern mantle of sedimentary deposit. We recognize the wide Suez trough, which contains at the surface several miniature horsts, such as Abu Durba, Ras Zeit and Shadwan, but also several small horsts, covered by miocene-pliocene deposits, and only discovered as a result of drilling operations, whereas in the narrow Akaba trough no miniature horsts have as yet been met with. The gulf of Akaba is about ten times as deep as the Gulf of Suez and on the borders of Sinai and in its northern part towards Akaba, shows no younger sedimental series of any importance. Thicker, younger sedimental series, by which some similarity with the Gulf of Suez is brought about, appear at the Gulf of Akaba only where the strike of the igneous belt has the direction of the Red Sea (South of Makna). The disturbances on the African side south of Safaga, near Kosseir, which Krenkel (*Geologie Afrikas,* p. 94, fig. 13) justly qualifies as complex, are very probably connected with the line of disturbance of Akaba. The rough course of the 500 metres and 1000 metres depth-curves (Akaba trend!) near the island of Shadwan tends to confirm this view. Von Seidlitz (1931) regards the Red Sea as being cut (Ueberschneidung) by the Akaba trough. For the Gulf of Suez another factor is of importance, in addition to its shallow depth, its width and its miniature horsts, viz. that the Carboniferous as well as the Jurassic sea clearly advances so far to the south as to come within its boundaries, which fact makes it probable that as early as Palaeozoic and Mesozoic time an area of depression existed here, in which (between terrestrial or subcontinental sandstone layers of Nubian facies) marine Carboniferous and marine Jurassic could be deposited.

In the above, the *young* tectonics have been represented, whereas fig. 2 gives a schematic outline of a possible development of the basement of Sinai and of Etbai as from the oldest pre-Cambrian, which outline deviates somewhat from Picard's scheme given in the *Bulletin de la Société géologique de France,* 5. série, vol. X, 1940, n° 1-2, and should only be considered as a working hypothesis for further field surveys.

(I). Faulting and parting of the blocks in an old pre-Cambrian sediment series = above fundamental gneiss × ×, probably representing an orthogeosyncline followed by an orogenic sialic magmatism in the sense of Stille. Fundamental gneiss has not yet been discovered in Sinai, but has been proved to be present in southern Etbai. Simultaneous intrusion of granite + + and granitic gneiss + +. This intrusion caused a contact-zone—and, here and there, injected gneisses (mica schists and paragneisses, more rarely lime-silicate rocks and andalusite schists). Probably an equivalent of the Shait granites which are found as pebbles in the Hammamat conglomerates (II).

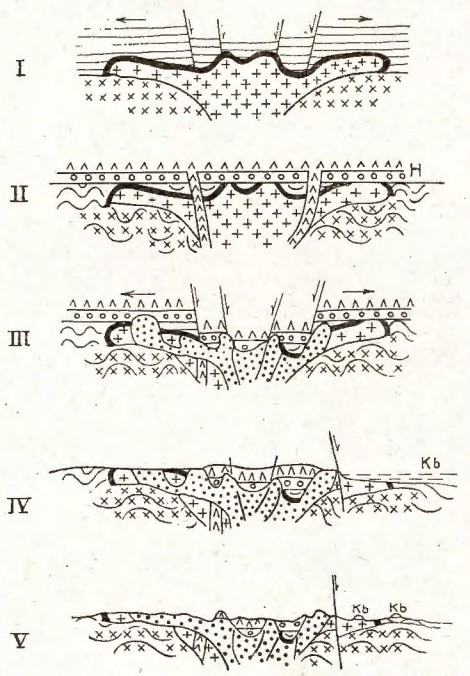


Fig. 2.

(II). Weak germanotype folding, erosion and peneplanation of the quasikratogene (Stille). This was followed by transgression of the Algonkian (Dokhan-Hammamat-Ferani series, the middle levels rich in conglomerates ○○, the deeper and higher levels rich in volcanic rocks ∧ ∧, only slightly dynamo-metamorphically and tectonically influenced). The volcanic rocks represent a subsequent volcanism of a quartzdioritic magma.

(III). Renewed faulting, partly with gentler folding of the quasikratogene (Stille) and intrusion of the younger post-Hammamat plutons ... (acid, partly alkali granites, grano-diorites and diorites) with rich, partly alkali dike rocks under a more or less pronounced formation of hornfels (mainly containing hornblende) in the Hammamat-Ferani series. The influence of the younger plutonic masses on the older

metamorphic sediments(I) has not been further investigated. By displacement to greater depth, further recrystallization of the old schists and granite-gneisses (I).

(IV). Erosion and peneplanation, unconformable deposition of the Cambrian in Transjordania, later on tilting of the block (northward inclination), connected with faulting (origin of the Gulf of Suez?). Consequently, inundation of the northern part of Sinai by the Carboniferous sea. Subordinate basic intrusions and flows. The Carboniferous overlies in a clearly unconformable way all granites and also the dike rocks belonging thereto!

(V). Mesozoic and younger faulting and the origin of the present relief. Entirely subordinate basic intrusions and flows (Oligocene).

Fig. 3, based on the investigations of J. Ball (1916), shows the plunging of the pre-Cambrian in northwest Sinai, in the neighbourhood of the famous Umm Bogma manganese mine. In the basement (the surface of the pre-Cambrian in north Sinai and the northern part of the eastern Arabian desert is practically horizontal) three small horsts are to be observed, which are separated by the Nasib trough and the El Qor depression respectively. Although the contact of Carboniferous and pre-Cambrian is in part decidedly tectonical, no important faulting is to be observed in the Cretaceous—either in the Nubian sandstone or in the marine, middle or upper Cretaceous. The Um Riglein horst shows up towards the north only as a slight spur at the contact of upper Carboniferous sandstone and Nubian sandstone. The two western horsts do not appear in the Upper Carboniferous and in the Cretaceous. That these faults are older than the Pliocene Gulf-tectonics is proved by the fact that the faults which caused the carboniferous displacement against the pre-Cambrian were cut off by these Pliocene faults (cf. fault over hill 350 metres). That the old pre-Cretaceous faults still continued their movement is probable from the fact that long basaltic dikes run in the direction of the marginal faults of the Um Riglein horst into the Nubian sandstone and into the marine Cretaceous area. These basaltic dikes belong, in my opinion, to the same basaltic series as is frequently met with farther north in Sinai. They are of Oligocene age.

With regard to the tectonical structure of the basement rocks of Etbai a distinction should be made between the old inner tectonical structure

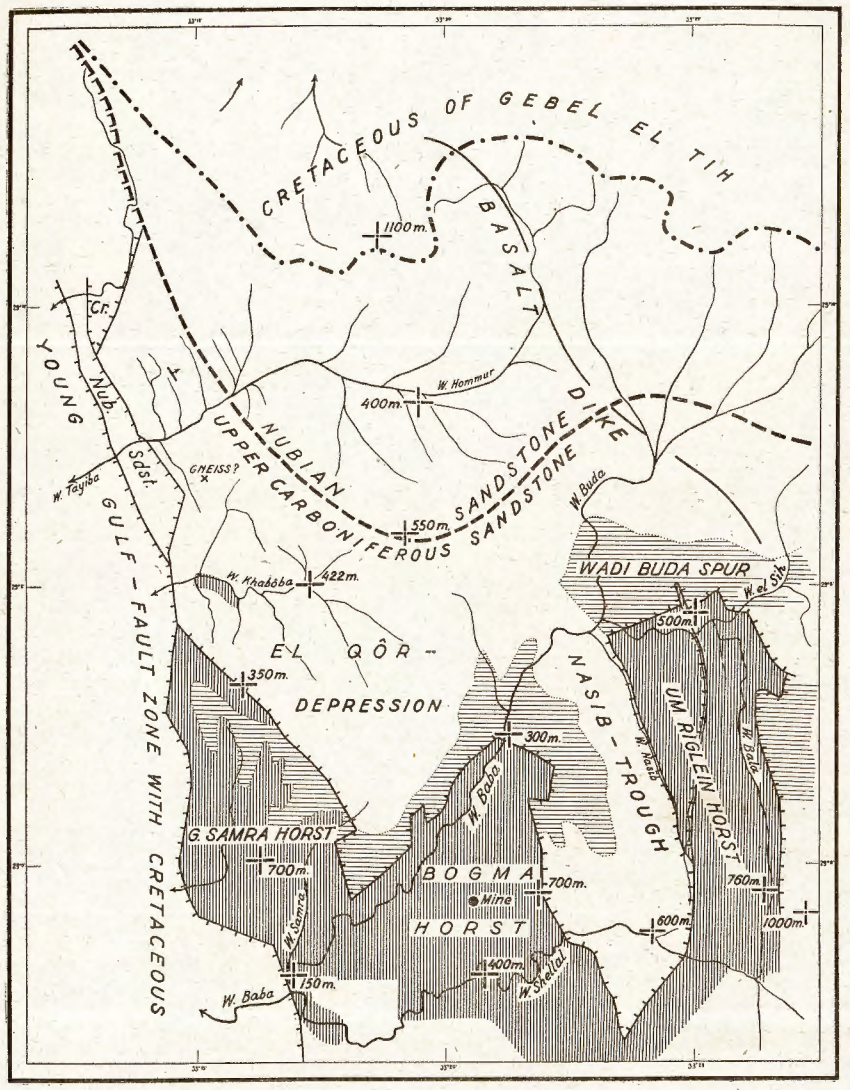


Fig. 3.

(pre-Cambrian) and the young outer Gulf-tectonics (Pliocene); *i. e.* even if the morphologic trend of the basement mountains is parallel to the

(TABULAR OUTLINE).

ETBAI.	
3. *Younger granite*	Large intrusions of granitic rocks, partly pegmatitic frequently containing microcline, partly alkaligranitic (anorthoclase), also diorite both with acid, basic and alkali dike rocks. Sialic magmatism in quasikratogene of germanotype tectonics (STILLE).
Hammamat series	Acid and slightly basic flows and sills between schists, graywackes and conglomerates. In the latter rolled fragments of a. and the Dokhan series. At the end of the Hammamat period volcanic activity took place (dacitic and felsitic magma). After deposition of the Hammamat series subsequent volcanism of quartz-dioritic magma.
Dokhan series . . . . . or *Shadli series*	Dacitic-andesitic, less frequently doleritic flows and tuffs. Schists and quartzite. Less pronounced geosynclinal depression with some basic initial volcanism; in upper part subsequent sialic volcanism predominant.
2. *Old granite*	Dark pink biotite granite (quite common in Hammamat conglomerate, partly foliated). Shait type. Less common granodiorites and typical alkalic rocks. Sialic magmatism of orogenetic period.
Atalla series	Older quartzite, partly bright red jasper, graywackes, rhyolitic, andesitic flows and older andesitic breccias, which, as pebbles, appear in the conglomerates of the Hammamat series. Subsequent sialic volcanism.
Baramia series	Ortho- and paragneisses. Orogenetic period with sialic plutonism. Mica schists. Mg series (serpentine, talc schists, etc.). Initial basic magmatism in orthogeosyncline.
1. *Archaic*	Fundamental gneiss.

EAST AFRICA.	
Main granite	(5) Hornblende granite to diorite. (4) Coarse-grained, light-coloured, partly microcline oligoclase granite without mica. (3) Gray biotite granite, microcline and albite oligoclase. Dike rock association as in Etbai.
Muva Ankole series	Sandstone, schists, jasper, rarely felsitic tuffs and conglomerates. In the latter rolled fragments of itabirite, Kuria porphyry and old granite.
Kuria granite	(2) Porphyry, Microcline gneiss granite. Oligoclase albite quartz.
Kuria volcanic rocks	Partly metamorphic, dacitic and andesitic flows between itabirite, schists, rarely marble and agglomerates.
Turoka series	Gneiss, crystalline schists, marble.
Gneiss granite	(1)

Gulf of Suez and the Red Sea, due to the youngest tectonical movements, the inner Algonkian structure mostly stands at right angles to them. This fact has not been fully realised by L. Picard in his paper *Sur l'orgénèse de l'Algonkien supérieur* (*Bulletin de la Société Géologique de France,* X, 1940, 1-2, p. 57), as far as Etbai is concerned. E. Hennig, *Afrika,* 1938, notwithstanding his opinion that the Red Sea is a very old structural element, considers the trend of the young Gulf faults as the dominant strike of the pre-Cambrian. So far, unfortunately, we know very little about the strike and dip of the basement rocks in Etbai. Fig. 4 shows that between latitudes 25° and 26° N. several lines of strike in the basement rocks have been measured. A strike running nearly parallel to the Red Sea is discerned. In many parts of this area an E-W strike is to be observed. E. Fraas (*Zeitschrift d. deutsch. geol. Ges.,* 1900, Heft 4) mentions a bend of the old schists west of Kosseir from NW-SE strike into E-W strike and again into NW-SE and N-S. So Fraas too has observed a pronounced E-W strike of some of the old schists. In my opinion the NW-SE strike of this region is a case of old tectonical movements and has nothing to do with the pliocene Gulf-tectonics. Hume announces (1934-1937) distinct NW-SE strike in Wadi Sellimat 26° 15′ N. Cf. Barron and Hume (1902); the "transverse chains of porphyry", in my opinion, run in the same strike as the Hammamat series.

My tectonical sketches of the mountains of northern Etbai and the Esh Melaha Range quite clearly show the approximately E-W strike of the pre-Cambrian, *i. e.* straight across the youngest tectonics.

A provisional tabular outline of the pre-Cambrian basement rocks of Etbai as compared with those in East Africa is given below. This outline shows the great similarity in the occurrence of the volcanics and the plutons.

This tabular, pp. 42-43, shows that I placed the younger East-African granite higher up in the stratigraphic column than F. W. Gevers (1938) did, viz. in the Algonkian. Further field research work is extremely desirable, so as to throw more light on the stratigraphic and tectonic relations.

B. The Gneisses of the Eastern Arabian desert.—In the area explored by me no *fundamental gneiss* has been found so far. Hume distinguishes in the eastern desert, south of the area under discussion, several types of gneiss, all of which I am inclined to consider as belonging to the *orthogneisses*—some to the fundamental gneiss and some to the younger gneiss (Sinai gneiss).

Besides the orthogneisses there are probably paragneisses, among which G. Andrew (1934) includes the Mitiq gneiss (immediately south of my exploration area). Gneiss in large areas occurs much farther north in Sinai than in Etbai. Even in Wadi Tayiba I discovered gneiss pebbles (cf. fig. 3), which fact makes it probable that the Gebel Samra horst is continued to the North. We are concerned with a biotite gneiss with a well-pronounced foliation, the accessories of which are some garnet and tourmaline. In general these gneisses are tectonically very slightly influenced. In the northern part of Etbai I found beside typical orthogneisses also paragneisses. The orthogneisses belong to the granitic and quartz dioric magma. The paragneisses are represented by albite-biotite-calcite schists. On the strength of my study on the occurrence of gneiss in northern Etbai (Part IV) the following summary may be given :

Between the large gneiss outcrops of Sinai and southern Etbai thus far known, I found, though in small quantities, *orthogneisses* and *paragneisses,* viz. *granodiorite* and *quartzdiorite gneiss* respectively. Typical injected gneisses were *not* discovered. The quartz-diorite gneisses are distinguished by their containing augite. They belong to the *leucopeléeitic magma*. *Albite-biotite-schists,* which moreover contain kaolin, calcite and epidote, are the representatives of the paraschists. Neither ortho—nor paragneisses belong to the group of the oldest gneisses, the fundamental gneiss, but to that of the Baramia rocks—which may be an equivalent of Andrew's Atalla series—and partly perhaps to still younger, but at any rate pre-Hammamat groups. This complex has undergone more intensive regional metamorphism than the younger Dokhan-Hammamat series.

Here as well as in Sinai the amphibolites, steatites and hälleflintas of the Baramia series must be clearly distinguished from the hornblende schists and hornblende hornfelses which occur regionally and result from a

relatively shallow contact metamorphism by young Algonkian granite on Algonkian sediments and flows which are, tectonically (germanotype), only slightly affected ("quasikratogene" of Stille).

In any case the gneisses described are older than the schists of the Dokhan-Hammamat series and in further mapping it should be taken into account that the gneisses of my exploration area (northern Etbai) occur *on older tectonical axes* of the pre-Cambrians, which strike approximately E-W, that is at about right angles to the present axes of the youngest fault tectonics. Above the gneisses the Atalla series occur partly sedimentary, partly as flows (keratophyres). These series have been intruded by plutonic masses of quartzdioritic and alkaligranitic magmas. (Part XI).

C. The Algonkian dokhan-hammamat series.—In Transjordania the same series as has been found in Sinai at Gebel Ferani, was discovered by Blackenhorn, unconformably covered by Cambrian; and on the strength of this fact we are justified in placing the Ferani series, and its equivalents on the African side, in the younger pre-Cambrian, as has been done by Barthoux, Hume and Picard.

The presence of the Dokhan-Hammamat series has been proved in a small area in several regions in the Ras Zeit range and in a larger stretch in the Esh Melaha range and in the high mountain region.

In the field, a division between the Dokhan and the Hammamat series cannot yet be carried out; it calls for more detailed survey-work. The thickness must be estimated at several thousand metres, so we have to do with an extensive depression area.

1. *Ras Zeit Range.*—In the *Ras Zeit range* (Part IX) occur chiefly black schists, with granite pebbles. The matrix has been altered by younger granite contact-metamorphism. There are also conglomeratic layers, which are so rich in light-coloured granitic components, that, if an intensive regional metamorphism had taken place, the original conglomeratic character could hardly have been recognized. One would sooner be inclined to surmise an original granite intrusion. These older granites (Shait type) often present also a pronounced alkalic character (cf. Part IX). Interstratified with this series are felsitic (liparitic and porphyritic) flows, some of which contain also rather light-coloured granite as xeno-

liths. Besides flows, dark, typical acid tuffs (partly brecciated) were observed.

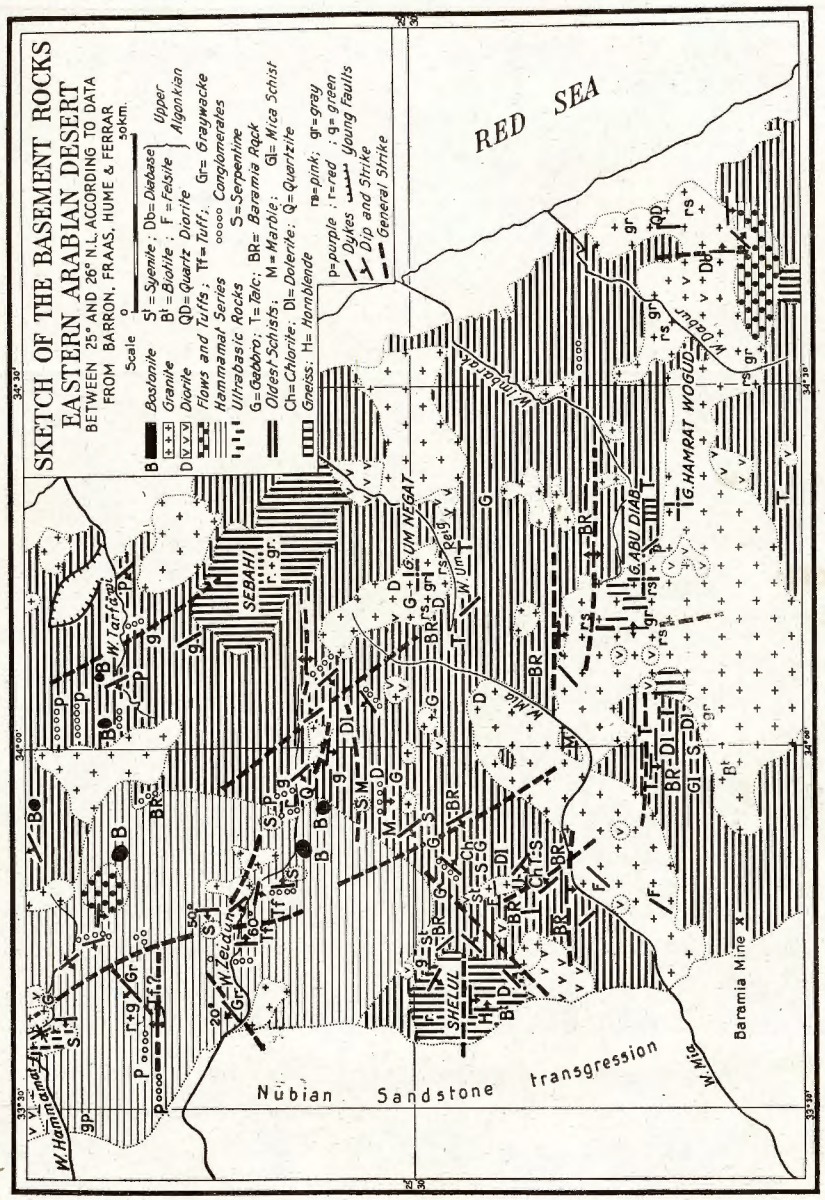


Fig. 4.

2. *Esh Melaha Range.* (See fig. Part VI).—The following table gives a summary of the Algonkian rocks investigated in this region.

TABLE.

	a. WADI DIB.	*b.* WADI ABU HAD.	*c.* ABU GERFAN 2 1/2 km. south of Wadi Abu Had.	*d.* WADI BELIH.
a. Old schists	Big conglomerates, some marble and chert. Rather numerous sediments.	Sporadic, thin conglomerates between tuffs and flows. Few sediments.	Sporadic quartzite. Very few sediments.	Abundant, thin conglomeratic layers between sandstone, pencil slate and graywackes. Abundance of sediments.
b. Old flows	Silicified tuffs : dacite; here and there andesite; chiefly as flows, more rarely as vertical dikes. A little tuff.	Flows of porphyry and porphyrite. A little tuff.	Porphyrites and porphyrite tuffs; porphyries and porphyry tuffs; quartz-porphyry tuff; melaphyre. Abundant tuff.	Porphyrite; quartz porphyry; orthoclase porphyry; melaphyre. A little tuff.
c. Younger intrusions	Dark-red, coarse-grained granites. Possibly some older serpentine and gabbro intrusions.	Dark-red, coarsegrained granites.	Dark-red, coarse-grained, pegmatitic granites and gray hornblende granites; green. concentrically weathering porphyrites.	Thus fas absent in Wadi Belih; however, found about 5 km. further north.
d. Youngest dike rocks	Granitic porpbyry.	Aplite, quartz-porphyry, orthoclase-porphyry; bostonite; camptonite.	Porphyrites; spessartites; quartz-porphyry; bostonite.	Diorite porphyrite and quartz-diorite porphyrite. Partly sub b.
e. Constituents of the old conglomerates :				
1) *Sediments*	Black phyllites; quartz-chlorite schists; graywacke sandstone.	Schists.	Absent.	Quartzite.
2) *Igneous rocks*	Aplite; micropegmatite; granodiorite; biotite-granite and abundance of andesite and keratophyre (Na; Part XI).	Quartz-porphyry; syenite porphyry.	Absent.	Quartz porphyry; orthoclase porphyry; diabase; felsite; porphyrite.
3) *Rolled fragments of a still older conglomerate.*	Dark andesite and lighter-coloured granite-aplite.	Absent.	Absent.	Absent.

We clearly recognize variations in the different sections. It could, however, not yet be concluded whether these variations originate from different stratigraphic positions or from differences in the facies.

The Hammamat series in the four localities is rougly composed as follows :

a) *Wadi Dib.*—Rather numerous sediments. A little tuff. Abundance of flows.

b) *Wadi Abu Had.*—Few sediments. A little tuff. Abundance of flows.

c) *Abu Gerfan.*—Very few sediments. Tuff plentiful. Abundance of flows.

d) *Wadi Belih.*—Plenty of sediments. A little tuff. Abundance of flows.

3. *Mountains* (Red Sea Hills).—The Hammamat and Dokhan series of the northern mountains, with the exception of some contact metamorphic regions, have not yet been thoroughly investigated by me. Mention may be made of the fact that in the Mongul region, as well as in the upper courses of Wadi Dib in the mountains, the Hammamat series occurs in partly conglomeratic, as well as in volcanic facies. I found the northernmost occurence of the Hammamat series in Wadi Um Arta, a tributary of the wadi Uldahal, which, on Blackenhorn's map (1921), is erroneously indicated as being "palaeozoic" (Part IX).

At Gebel Dokhan a more exact definition of the older Shadli series with abundant dolerite flows of the somewhat younger Hammamat series has still to be completed by carrying out further detailed mapping. The existence of two different andesitic flow-periods is proved by the presence of andesite etc. pebbles in the Hammamat conglomerates, which themselves lie between andesite etc. flows. Moreover, there is still a third pre-granitic eruption period, viz. the post-Hammamat volcanic series, Hume's II, 1, p. 268, which, however, has been called in question—in my opinion wrongly—by Barthoux and which is undoubtedly of pre-upper Algonkian granite age.

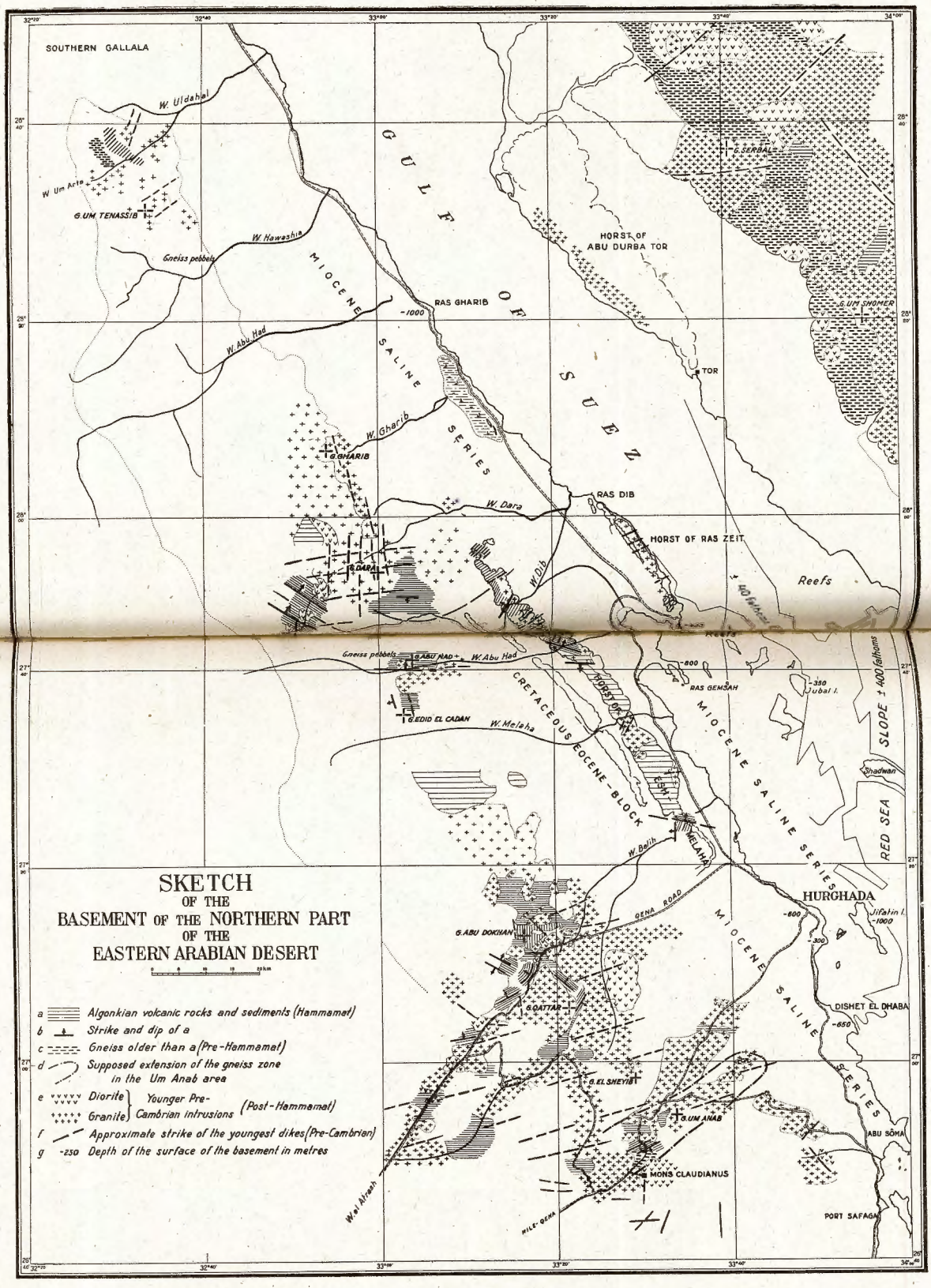

SOUTHERN GALLALA
W. Uldahal
W Um Arta
G.UM TENASSIB
W. Hawashia
Gneiss pebbels
MIOCENE
SALINE SERIES
RAS GHARIB
-1000
W. Abu Had
W. Gharib
G.GHARIB
W. Dara
G.DARA
RAS DIB
W.Dib
HORST OF RAS ZEIT
Reefs
G.SERBAL
HORST OF ABU DURBA TOR
G.UM SHOMER
TOR
GULF OF SUEZ
Gneiss pebbels
G.ABU HAD
W.Abu Had
-800
RAS GEMSAH
350
Jubal I.
SLOPE ± 400 fathoms
G.EDID EL CADAN
W.Malaha
CRETACEOUS EOCENE-BLOCK
Shadwan
RED SEA
W.Baih
HELANA
HURGHADA
Jifatin I.
-600
-300
-1000
GENA ROAD
G.ABU DOKHAN
G.QATTAR
DISHET EL DHABA
-650
G.EL SHEYIB
G.UM ANAB
ABU SOMA
MONS CLAUDIANUS
PORT SAFAGA
Wadi Araba
MILE-GENA
SKETCH
OF THE
BASEMENT OF THE NORTHERN PART
OF THE
EASTERN ARABIAN DESERT
a Algonkian volcanic rocks and sediments (Hammamat)
b Strike and dip of a
c Gneiss older than a (Pre-Hammamat)
d Supposed extension of the gneiss zone in the Um Anab area
e Diorite / Granite } Younger Pre-Cambrian intrusions (Post-Hammamat)
f Approximate strike of the youngest dikes (Pre-Cambrian)
g -250 Depth of the surface of the basement in metres

Fig. 5.

I visited Wadi Um Arta and Wadi Dara, situated about 80 kilometres south of Wadi Um Arta. In this area I discovered high hills, which are composed of tuffs and flows, more or less horizontally deposited. Porphyrites of a very nice flow structure with feldspar porphyroblasts, measuring 1-2 centimetres, outcrop here. Besides the volcanic series conglomeratic layers also occur, partly alternating with schists (strike NW-SE; dipping N). As in the area already mentioned, it has been found that here also the whole series has been intruded by young Algonkian granitic masses. In the case of contact metamorphism an impregnation with hematite sometimes took place. Furthermore, the Hammamat series contains the more important copper ore impregnation of Etbai and Sinai.

About 30 kilometres south of Wadi Dara lies Wadi Abu Had, which, a short time ago, was still *terra incognita*. Here it has been ascertained that, besides old schists, plentiful volcanic rocks occur and that there are brecciated layers in this sequence of formations. These layers are composed of fragments of a pink porphyritic granite and of a dark-brown porphyrite, besides smaller fragments of sediments and of a red jasper. The strike is approximately E-W with N-dipping, *i.e. at right angles to the present horst,* which originated in the Pliocene. Contact metamorphism and impregnation with hematite result from the younger granite intrusions. The contact schists generally contain hornblende and much magnetite. In cases where the hornblende content is smaller, more biotite has been observed.

At Gebel Dokhan so far no thick conglomeratic layers have been discovered. Often, however, fist-sized rolled fragments of old sediments and igneous rocks occur quite unexpectedly in the schists. The strike fluctuates round about the E-W direction. The dip runs partly to the North and partly to the South.

In the lower Wadi Ghosar, not far from the Roman fort, we unexpectedly find rose-coloured aplite fragments, 5 to 10 centimetres in diameter, as typical pebbles, in the fine-grained schists, as at the Kenah-Hurghada road. In the upper course of Wadi Ghosar the Hammamat series also outcrops; here, however, without flows. We have probably to do with about the same stratigraphic level as that which continues east of Gebel Gattar in

Wadi Um Anfei and which has been described in Part V. In Wadi Ghosar the sedimental and the volcanic series are intruded by granite as well as by diorite. The Hammamat series mostly dips away from the younger granite; sporadically, however, a plunging of the Hammamat series under the igneous mass (Gebel Gattar) has also been clearly observed.

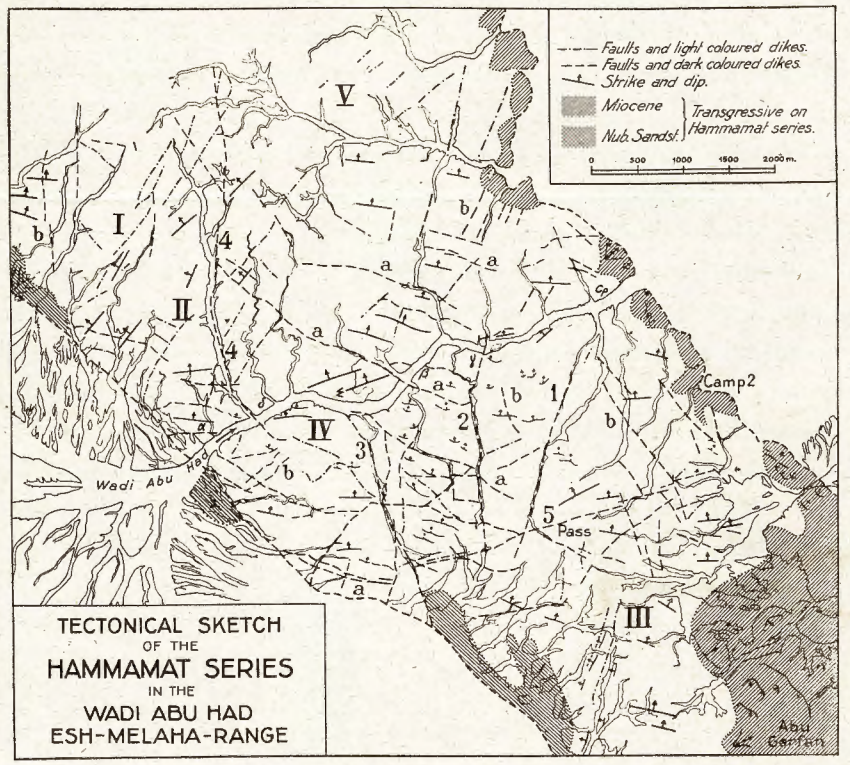


Fig. 6.

In northern Etbai plenty of quartz-porphyritic volcanics occur in the Hammamat series. Typical basic rocks are rare in northern Etbai, but occur more frequently in the southern part (Barron and Hume 1902), perhaps also in slightly older layers. Here we might speak of initial volcanism in the sense of Stille (1939). In the southern part, besides volcanics, plenty of hornfelses occur, which most probably cover the younger still buried igneous masses.

Andrew (1939) believes that he has found the Hammamat series also in the Aswan region, which has often been altered by porphyritic granite (hornblende). In the adjacent southern region—not visited by me—approximately E-W strike predominates (Andrew 1939), partly with local intensive tectonics (thrusting without shearing).

D. Contact metamorphic rocks of the Hammamat series.—Since both in Sinai and in northern Etbai pure shales and limestones are very rare, the corresponding contact metamorphic rocks, marble, lime-silicate rocks, andalusitic and cordieritic schists, occur only very sporadically. The *typical contact mineral* of the (chiefly arkosic) rocks, in addition to volcanic rocks of the Hammamat series, is a *green hornblende,* which is to be considered as belonging to the *pargasite*. Especially in the mountains hornblende-hornfelses occur in large areas. The hornblende is, microscopically, often so clearly discernible in the blackish rocks, that I take it that Barron has sometimes considered these rocks, on the strength of their microscopical aspects, as belonging to this "old dolerites".

In southern Etbai facies richer in sediment would then occur, whereas, as already stated above, facies rich in volcanics are present in the northern part. Besides, it does not seem impossible to me that a part of the older mica schists of Aswan and Sikait are not regional metamorphic crushed quartz mica syenites (cf. Hume), but contact rocks. It would be remarkable indeed if in a region of large granite intrusions no contact rocks were found in older schists; the original material should, in my opinion, be schists rich in quartz with tuffogenic components (cf. Andrew, 1939).

Andrew admits that in consequence of intensive contact metamorphism the Algonkian sediments in places give the impression, owing to great crystallinity, of being older than they really are. Besides, according to Andrew, the contact metamorphism is a regional occurrence in southern Etbai.

In the Red Sea Hills at the Bir Badia well and in the lower Wadi Ghosar I could observe that the schists are often completely impregnated by thin and exceedingly thin granitic veins. As a result of such intensive contact biotite-hornfels, more or less rich in hornblende, originated.

In exogene inclusions in the granite hornfelses, containing *pyroxene,* have also been found in several places. Pyroxene is, like the plagioclase, a rather rare mineral constituent of the hornfelses of Etbai. They originated, in the Etbai region, only through quite intensive contact metamorphism. Hume reports, II, 2, p. 615, that "hornblende schists play a very important part in the composition of the schists near the junction with the intrusive igneous rocks". According to Andrew the line of strike of the contact metamorphic schists with granite gneiss intrusions runs in an approximately E-W direction. As a rule contact metamorphism in southern Etbai is not very pronounced.

The Hammamat mass of the Esh Melaha hills generally shows less contact metamorphism than the mountains, which fact is due to the smaller dimensions, the deeper site of the plutonic masses and to the predominance of flows. In the Esh Melaha range, however, the search for hornblende-hornfelses has yielded specimens which are identical with those of the mountains. The site of this first discovery is in the most northerly part of the Esh Melaha range, at Gebel Abu Shaar.

In the Ras Zeit range the typical hornblende-hornfelses of the mountains have not yet been found. The most frequently occurring contact mineral here is an olive-green biotite. The occurrence of biotite is connected with the presence of biotite in large quantities in the original material, a biotite granite. For in the Ras Zeit range a large proportion of the layers of arkosoic sandstone and of the boulder beds consists of biotite granite. In the matrix of these sediments, therefore, very numerous secondary concentrations of biotite have been present, which biotite has been recrystallized by contact metamorphism. Mention has already been made of the fact that in these contact metamorphic rocks tourmaline suns are discernible under the microscope, so that there are occasional indications of pneumatolytic effects. Once more it should be pointed out here that due to the absence of subsequent regional metamorphism, the original sediment is still distinctly perceptible. In case these sediments, rich in granite boulders, had been subjected to regional metamorphism after the contact metamorphism, as for instance in Fennoscandia, the sedimental origin would scarcely be discernible and this series might have been considered as belonging to the

orthogneisses. We should then feel tempted to speak of a sheet of granite, where originally we had to do with a conglomerate with an abundance of granitic constituents.

E. The Post-Hammamat Plutonic masses.—It is a matter of importance to realize that *after* the deposition of the Hammamat series *without* an intensive folding taking place (germanotype tectonics), large sialic plutonic masses, ranking among the largest in the world, intruded. Similar young Algonkian intrusions also occur in East Africa (cf. outline) and in the youngest Algonkian of Michigan (Keweenawan), viz. the red, tectonically uninfluenced Killarney granite, which most certainly is still pre-Cambrian. The rocks of the plutonic masses of the northern part of Etbai have already been described in somewhat greater detail, from a petrographic standpoint (cf. Schürmann, 1913, 1921 and Part V).

The plutonic masses of the mountains generally belong to the acid granites, which often have an alkali character and then carry minerals of rare earths, though in small quantities, sometimes also barite. Granodioritic and dioritic plutonic masses occur less frequently in the mountains. Pneumatolytic effects (fluorite) are of secondary importance. The youngest granites produced the rare molybdenum and tungsten ores, the somewhat older diorites the more frequently occurring gold. In Gebel Gharib typical riebeckite granites have been collected, containing small quantities of other rare minerals, such as barite, sodalite and minerals of the rare earths.

F. The dike rocks in the younger Plutonic masses.—In the introduction mention has already been made of the frequent occurrence of rocks which thus far have been rare or entirely absent in the pre-Cambrian. Red felsites and porphyries (older) and blackish diabases (younger) have mostly been found. Moreover, we still find typical dike rocks, such as graniteporphyry, malchite, kersantite, vogesite and minette. These rocks generally show a calc-alkali character. Typical alkali rocks, however, are also present. Besides riebeckite graniteporphyries and riebeckite porphyries we find plenty of bostonite, quartz-bostonite, riebeckite bostonite and camptonite (cf. Schürmann, 1921). I have grouped

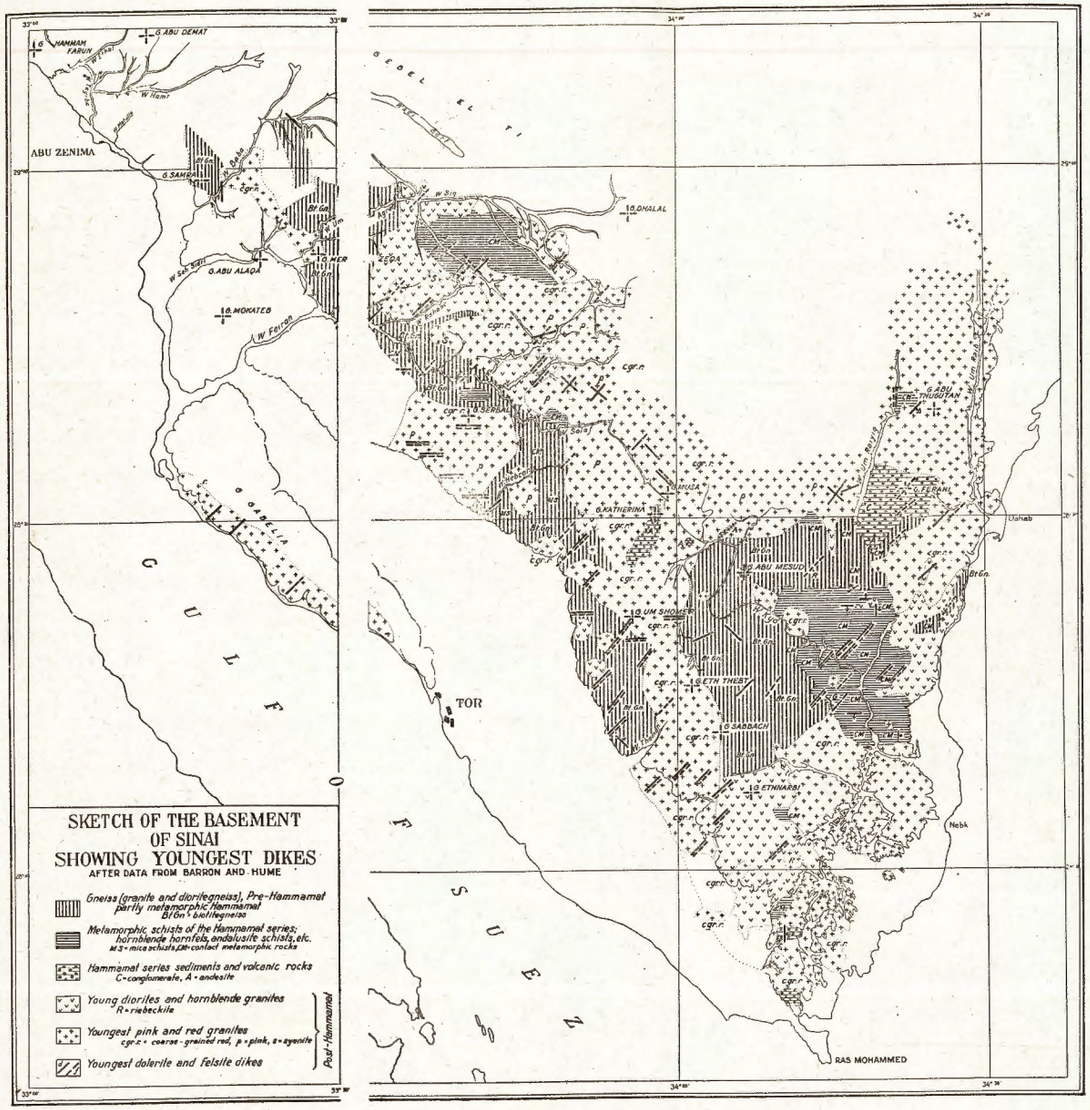

SKETCH OF THE BASEMENT
OF SINAI
SHOWING YOUNGEST DIKES
AFTER DATA FROM BARRON AND HUME
Gneiss (granite and diorite gneiss), Pre-Hammamat partly metamorphic Hammamat
Metamorphic schists of the Hammamat series; hornblende hornfels, andalusite schists, etc.
Hammamat series sediments and volcanic rocks
C = conglomerate, A = andesite
Young diorites and hornblende granites
R = riebeckite
Youngest pink and red granites
Youngest dolerite and felsite dikes
Post-Hammamat
ABU ZENIMA
G. ABU DEMAT
HAMMAM FARUN
G. SAMRA
G. ABU ALAQA
G. MOKATEB
G. BARELIA
G. ONALAL
G. KATHERINA
G. ABU MESUD
G. UM SHOMER
G. ETH THEST
G. SABBACH
G. ETHNARBI
G. ABU THUSHAN
G. FERANI
TOR
RAS MOHAMMED
Nebk
Dahab
GULF OF SUEZ
GULF OF AQABA

Fig. 7.

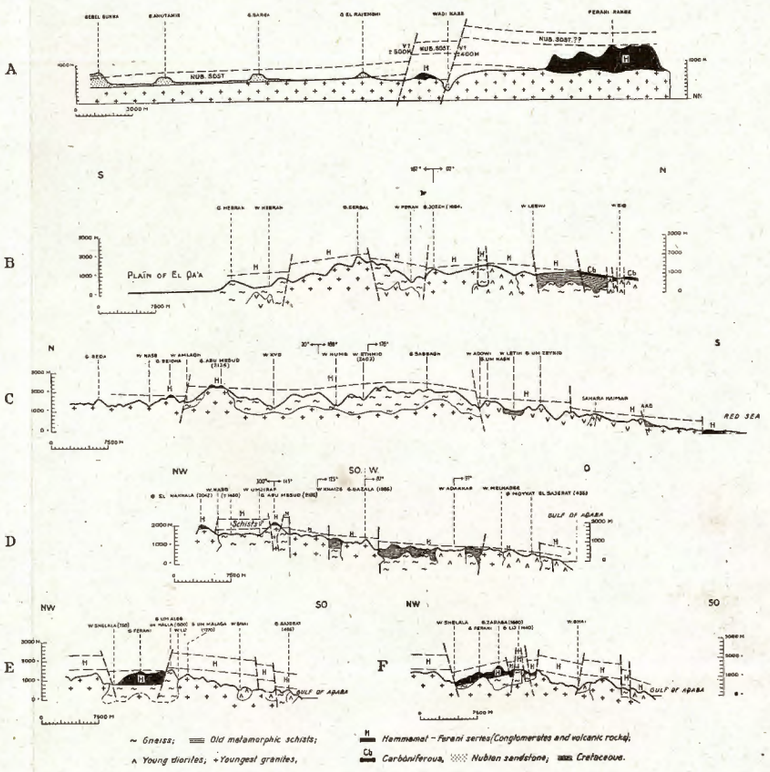

A
B
C
D
E
F
PLAIN OF EL QA'A
RED SEA
GULF OF AQABA
Gneiss; Old metamorphic schists;
Hammamat - Ferani series (Conglomerates and volcanic rocks);
Young diorites; Youngest granites;
Carboniferous; Nubian sandstone; Cretaceous.

Fig. 8.

together under "Gharib type" (Part VII) the riebeckite rocks, rich in potassium, of northern Etbai.

G. THE STRIKE OF THE YOUNGER DIKES.—The dike rocks are in my opinion differentiation products of a single magma under cooling conditions, with partial refusion of older granites, etc. When the granitic plutonic masses were frozen, faulting caused the first accession of the acid and alkalic rocks, while the intrusion of the heavier residual diabasic magma (more mobile and still viscous at lower temperatures) is due to an additional faulting period.

In northern Etbai and Sinai, the younger dikes are among the most striking features. On close examination we come to the conclusion that we here have to do with a *regional appearence,* which is connected with general main tectonics. The acid rocks are nearly always the older, the diabasic rocks the younger intrusions. Further I could ascertain that the *two dike systems* often intersect at right angles.

Beside intersecting dike systems, however, *compound dikes* also occur. Diabase, for instance, is present beside felsite in one and the same dike. Here again it has been ascertained that the basic rocks belong to the younger species. The dikes often extend out of the plutonic masses into the sedimentary cover. In many cases these dikes run parallel to the main disturbances of the *older sedimentary* mantle rocks. As mentioned above, the disturbances in the old sediments are mostly at right angles to the normal line of strike. This explains why the acid dikes often run right across the line of strike of the old sediments.

The basic dikes of Aswan are young. The same dike intersects both gneiss and schists as well as the youngest granite. The felsitic dikes occur more rarely in the Aswan region than in northern Etbai, and withdraw far behind the basic dikes. The largest felsitic dike, 700 metres long, strikes NNW-SSE, *i.e.* it runs approximately at right angles to the line of strike of the basic dike.

The very pronounced joints filled up with igneous rocks lie mainly transversely to the ordinary joints observed by v. Seidlitz, *i.e.* the basic and mostly younger dikes run as a rule more or less at right angles to

the southeastern pressure direction, whereas the older acid dikes are approximately parallel to the pressure direction.

The results of my investigation also indicate the probability of a southeastern pressure direction in Etbai. I should only like to express it in more general terms and to speak of a pressure direction lying on or near the N-S line. The younger diabasic dikes, principally striking E-W, in that case run at about right angles to the pressure direction (cross faults) and the older acid dikes (longitudinal faults) run parallel to it. This would correspond with the generally accepted opinion that the cross faults originated first and the longitudinal faults later.

The folding of the Hammamat series is very slight in northern Etbai—to which fact I have repeatedly drawn attention—so the explanation of the structure of the plutonic masses in our area as being a result of folding tectonics, does not seem probable. It is more likely that in this case we should take into account indications of *faulting* (germanotype tectonics) in the Algonkian (fracturing of the blocks into a mosaic structure of blocks which are horizontally shifted). Further field surveys will throw more light on this problem.

In any case—regarding Etbai—we should bear in mind the possibility of drawing conclusions from the regional lines of strike of dikes, based on certain stress phenomena (dislocation, distension and compression joint) which must be connected with the main tectonical features of this kratogenic area. As one system of the dikes runs parallel to the Gulf of Suez, one might expect besides the horizontal displacement also fault structure and an old origin of the Gulf of Suez.

In my opinion there must be a difference between joints filled with dike rocks in a monogenic plutonic mass caused by the difference between the greatest and least tension and the regional joints filled with dike rocks intersecting both plutonic masses and wall rocks and originated from horizontal displacements. In this case the occurrence of tension fractures at an angle of 45° to the horizontal displacement may be expected.

H. The magmatic consanguinity of the igneous rocks of northern Etbai.—Six principal classes may be distinguished :

Old : the fundamental gneiss (mainly sialic),

the younger gneissic series, including the basic Baramia (Mg) series;

quartz keratophyres etc. of the Atalla series;

the old granites and granodiorites, partly gneissic (Shait type), partly of a magma rich in soda;

the Hammamat-Dokhan volcanic rocks of quartz-dioritic magma.

Young : the younger plutons (mainly granitic, but also dioritic and alkali-granitic) with their various dike rocks.

The magma of the various, mostly acid, older *gneisses* shows great variety. Pure granitic and dioritic magmas were ascertained; occasionally an alkali character was met with. Apparently quartz-dioritic magmas predominate (cf. Part IV), the same as in the case of the younger gneisses. The three analysed quartz keratophyres, boulders of the Hammamat conglomerate, are of Atalla age; partly they may be dike rocks belonging to the old granites (first series).

The *old granites* of the Shait type belong partly to the alkali-granitic, partly, however, to the granodioritic and syenitic magma. These older magmas often show obvious affinities to types richer in Na (*e. g.* maenaitic).

Between the younger gneiss series and the Shait granites we should place the ultra-basic Baramia series—rich in magnesium—which comprises amphibolites, serpentines and gabbros, and which occurs near Um Anab, but chiefly to the south of my exploration area. The Dokhan-Hammamat volcanic series (subsequent volcanism) belong, in the first place, to the normal quartz-dioritic magma, more rarely to the diabasic magma of southern Etbai. The diversified younger plutonic masses reveal the occurrence, in addition to alkali-granitic magma, also of loucoquartz dioritic magma. This is also evident in the younger dike rocks, which leads to the conclusion that alkali-granitic magma was regularly produced side by side with quartz-dioritic magma in all the pre-Cambrian. Albitisation phenomena occur in the younger gneisses in the Atalla keratophyres and in the older plutonic masses of the Shait type as well as in the youngest, mostly acid plutonic masses and their acid dike rocks—thus here again appearances which may be observed in all the pre-Cambrian. The close occurrence of alkalic and calc-alkalic pre-Cambrian rocks of Etbai resembles the variations of the much younger alkali and calc-alkalic

volcanic rocks of East Africa (R. A. Daly, 1933, p. 539). In my opinion, there are strong indications that the albitisation of these rocks is a secondary phenomenon, which took place at the end of each intrusion due to replacement by rest magmas rich in soda.

Attention should be drawn to the striking fact that in between the *older* and *younger* plutonic intrusions—both sialic and rich in alkali—the Hammamat series rich in quartz-porphyritic volcanics occurs and no alkali rocks are present at all. As the Hammamat series contains limestone and dolomites, conditions as postulated by Daly for the generation of alkali rocks do exist, but in the case of Etbai—adopting Daly's theory—one is forced to assume a difference in reaction by plutonic and volcanic rocks. If a basic magma absorbs such limestone or dolomite material it is quite possible that a quartz-porphyritic magma is formed. Alkalic character, in general, points to fault tectonics of already consolidated old peneplain—or table—regions, which tectonical condition exists also in northern Etbai. According to Cloos (1939) cratogenic regions are affected by deep joints under the influence of lifting and subsiding, perhaps also of drifting, along which the magma rose from great depht over a great horizontal stretch, absorbing far fewer minerals. This would explain the similarity of the Egyptian principal types of granite over great horizontal stretches. If the alkalic character of the various igneous intrusions of Northern Etbai is chiefly a secondary phenomenon, one has to assume the quartz-dioritic magma as the one most generally represented, which, owing to the prevailing tectonical features, was subjected to replacement mainly by Na, over large areas in various pre-Cambrian horizons.

I. Comparison of the igneous rocks of northern Etbai with the basement of the neighbouring region.—The greatest similarity—as was to be expected—is found in *Sinai*. Yet it should be observed that in Sinai the gneisses and the occasionally very strongly metamorphosed old schists occupy a much larger area than in northern Etbai. The Hejaz is far less known than Etbai and Sinai, in spite of the work of Kober. We know very little about the tectonics of the basement of the Hejaz, but Kober's statement that an E-W strike has been observed is of importance.

The rocks of the Hejaz investigated by Waldmann prove that we have here to do with the same young plutonic masses with the same rocks as in Etbai. Waldmann also observed the same albitisation phenomena. Further east in *Arabia* we find pegmatitic red granite and alkali granites in the pre-Cambrian in *Shammar* and *Nejd*. In *Yemen* a socle also occurs consisting of gneiss, mica schists and quartzite. Above this basement are deposited little metamorphic sediments of Algonkian age, into which aegirine granite intrude (Krenkel, *Zeitschrift der Deutschen Geol. Gesellschaft*, vol. 93, 1941, n° 7/8, p. 367). Farther east we meet with the Algonkian of the island of *Sokotra*. The publications of Kossmat and Pelikan have thoroughly informed us about the basement rocks of this island; and on the strenght of my experience in Etbai I believe that the sequence of formations of the basement complex of Sokotra may be arranged as follows :

1. youngest dike rocks (diabase and kersantite) which run parallel to the basement rocks (gneiss).
2. younger acid plutonic masses, partly with riebeckite granite.
3. somewhat older plutonic masses with diorite and quartz diorite.
4. Hammamat series with hornblende hornfels, porphyry tuffs and clay schists.
5. Baramia series : amphibolites and gneisses.

This comparison of the basement rocks of northern Etbai with those of Sinai, Hejaz and Sokotra (Part X) and the above-mentioned conjectured correlation with East Africa prove that the younger pre-Cambrian of North-East Africa shows uniformity in its general aspect; it is remarkable for the gentle germanotype tectonics (of a quasi-kratogenic area, Stille) partly with E-W trends, of a very large sequence of epicontinental formations, rich in volcanics of quartz-dioritic magma (subsequent sialic volcanism of Stille), and for enormous subsequent, mostly acid, shallow sialic intrusions (rich in alkalic rocks, Na!) of a regional character, due to faulting.

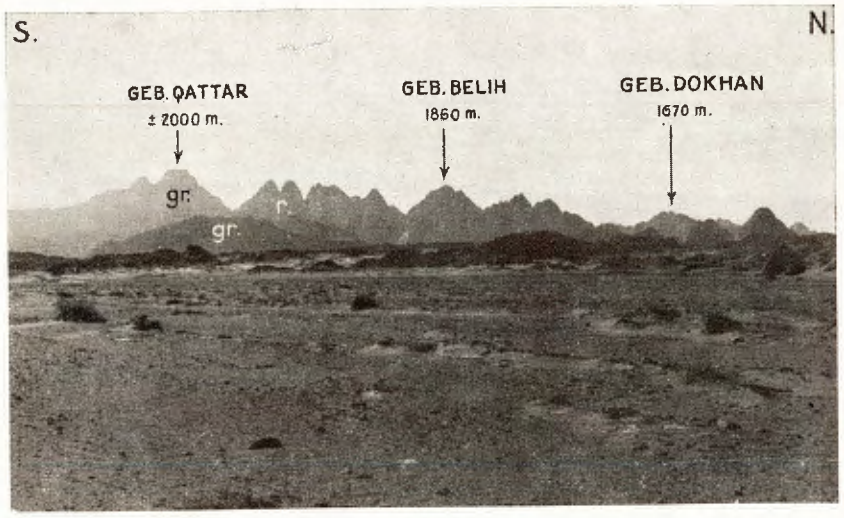


Photo M. Franken.

Red Sea Hills.
27°10′ lat.
r = red granite; gr = grey pink granite.



Photo Dr C. E. Thiébaud.

Faulted northern plunge of Etbai.
28°35′ lat.

WILLIAM FRASER HUME

(1867-1949)

BY

O. H. LITTLE.

Dr. W. F. Hume died at Rustington, Sussex, on 23rd February 1949 and by his death the Royal Geographical Society of Egypt has lost a Past-President who was one of its most eminent representatives and a pioneer of geographical and geological exploration in this country. Hume was elected a Member of the Society, about 35 years ago and was a Member of the Council since 1917. In 1926 H. M. King Fuad I was pleased to appoint him President of the Society, an office that he held for fourteen years, until 1940, when, owing to the war, he was not able to return to Egypt.

He was a member of the Executive Committee which organised the International Geographical Congress that was held at Cairo in 1925, and was leader of the excursion to Quseir, on the Red Sea coast, after the Congress. He was also a member of the Executive Committee of the Navigation Congress held at Cairo in 1926.

He attended many International Congresses where his gift of languages and fluent speaking were an immense advantage. He attended the International Geological Congress at Zurich in 1894 and that held in Russia in 1897. As Director of the Geological Survey of Egypt he was a delegate of the Egyptian Government to a number of congresses. He was sent to Stockholm to the International Geological Congress and the Agrogeological (Soils) Congress which were held there simultaneously in 1918, and was elected a Vice-President of both congresses. He attended the International Geological Congress in Canada in 1913 and

the International Geographical Congresses that were held at Cairo, 1925; Cambridge, 1928; Paris, 1931; and Amsterdam, 1938.

Hume was a member of the Egyptian delegation which presented the *Atlas of Egypt* to the International Geographical Congress at Cambridge in 1928. The Atlas contains a series of maps and diagrams with descriptive text illustrating the Orography, Geology, Meteorology and Economic conditions of this country and had been prepared for the Congress, by command of H. M. King Fuad I.

He was the delegate of the Royal Geographical Society to the International Geographical Congress at Paris in 1931, where he was a member of the Congress Committees on :

The Map of the Roman Empire;

The Pliocene and Pleistocene Terraces;

Climatic Variations;

Geological Map of Africa.

He presented the *Album of Views of Typical Egyptian Desert Scenery,* that had been prepared by command of H. M. King Fuad I for the Congress.

Hume was born in Cheltenham on October 1st. 1867 and spent the early years of his life in Russia where he acquired a good knowledge of French, German and Russian before his family returned to Cheltenham in 1878. With his brother, the late Sir George Hume, MP. he was sent to Collège Gaillard, Lausanne for three years and then to Germany.

He took the Associateship of the Royal College of Science, London in Geology and the Associateship of the Royal School of Mines in Metallurgy in 1889. He graduated at London University with first place in the B. Sc. Honours examination and was awarded the D. Sc. in 1893.

He was appointed on the staff of the Geological Department of the Royal College of Science, London in 1890, was Senior Demonstrator in 1897 and was Examiner in Geology to the Royal Indian Engineering College, Cooper's Hill. He also lectured on geology to the students of the School of Engineering (now the Faculty of Engineering Fuad I University) for a number of years from 1907 onwards.

The Geological Survey of Egypt was founded in 1896 by Capt. Lyons (later Col. Sir Henry Lyons. F. R. S.) and Hume joined the Survey in

1897. When Col, Lyons resigned in 1909 Hume succeeded him as Director Geological Survey. In 1927 he relinquished the post of Director and was made Technical Counsellor, Geological Survey in order that he could devote his whole time to writing his *Geology of Egypt,* the first volume of which had been published in 1925.

After 1927 he came to Egypt, at first for 6 months and later 4 months each year and worked for the rest of the time in England where he could discuss problems that arose in his work with specialists and consult publications that were unobtainable in Egypt.

The Geological Survey was founded to undertake a geological reconnaissance of this country and in the beginning its work included both geographical and geological exploration. For the first twenty-five years the expeditions had to rely on camel transport and in the early days only the minimum amount of equipment and transport was available, so that work was often carried out under extremely trying and uncomfortable conditions.

From the earliest days of the Geological Survey some members of the staff were engaged on measuring river discharges in the Sudan and on the examination and mapping of the cataracts of the Nile to determine the most suitable sites for reservoirs. Hume worked on the 2nd Cataract in 1901, on the cataracts between the 2nd Cataract and Dongola in the early part of 1902, on Dal Cataract in 1906 and in 1907 on the Shabluka Cataract and the 4th Cataract, near Shirri Island. Towards the end of 1902 and in 1903 he measured discharges of the White Nile at Dueim and of the Blue Nile at Khartum. The results of the survey operations and geological investigation showed that no other site offered such favourable conditions as that at the head of the First Cataract at Aswan. It was therefore decided to increase the capacity of the Aswan reservoir by raising the level of the dam and the first heightening was completed in 1912.

Very little of the desert had been mapped when the Geological Survey was founded therefore the topography had to be mapped as well as the geology. The reconnaissance maps were on small scales (1 : 500,000 and 1 : 250,000) but areas were mapped on 1 : 100,000 and 1 : 50,000 in districts where the expeditions had discovered mineral

deposits. These discoveries led directly to the foundation of the important phosphate and manganese mining industries and the geological exploration was of great value in the search for petroleum. Hume discovered the "oil-rock" at Hurghada in 1911, two years before the Anglo-Egyptian Oilfields drilled their first successfull oil-well.

Reconnaissance surveys were replaced by mapping controlled by triangulation about 1905 and larger scale maps were made of areas of possible economic importance. This led to the work of the Geological Survey being confined principally to the coastal districts of the Gulf of Suez and Red Sea.

Hume was adviser on water-supply to the British Army in Egypt, 1915-1917, and in connection with the advance through Northern Sinai he paid frequent visits to the front. He summarised the results of his investigations for publication in the "British Army Medical History of the War".

The Hurghada Oilfield was developed rapidly by the Anglo-Egyptian Oilfields Ltd. during the 1914-18 war and the Government decided to intensify the search for oil in Egypt. A petroleum Development Committee, of which Hume was a member, was formed, more geologists were engaged and he was put in charge of the geological investigations. In 1919 seven geologists and two surveyors were engaged on geological surveys, principally in the oilfields region along the coasts of the Gulf of Suez and Red Sea, and this work continued until 1924 when the Government decided to abandon boring operations for oil and the work of "Petroleum Research" was shut down. There were only three geologists including Hume on the Geological Survey in 1925 and when he was appointed Technical Counsellor in 1927 the number was reduced to one. The results of the field-work were published between 1920 and 1925 in twelve "Petroleum Research Bulletins".

The total number of Hume's publications is 109, of which 23 were Geologicar Survey reports (four of these being joint papers); six were Bulletins by him and the geologists of the Petroleum Research Board on their joint work; 70 were papers in various scientific journals and he was joint author of ten other publications. He had already published seven papers, (three of these on Russian geology) before he joined the

Geological Survey. A complete list of his publications is given at the end and the variety of the titles gives an indication of the value and extent of his contribution to geology and geography.

The earlier reports of the Geological Survey were records of exploration and contained notes on the antiquities, botany, zoology and meteorology of the desert areas examined. Hume's first publication for the Geological Survey was a joint report with Barron, on the work of their two parties during two seasons in the desert. It was entitled *Topography and Geology of the Eastern Desert of Egypt*. (Central Portion) and appeared in 1902. it included a geological map on 1 : 500.000 of the country along the Red Sea coast lying to the east of longitude 32° 30′ E and between latitudes 26° and 28° N. There was also a map on 1 : 100.000 of the phosphate deposits of G. Duwi district and another on 1 : 50.000 of similar deposits near W. Barûd. It laid down the main lines of the topography and geology of an area of about 30.000 square kilometres.

Another of his more important publications was *The Topography and Geology of the Peninsula of Sinai* (South-eastern Portion). 1906, which deals with about 3.750 square kilometres of some of the most rugged country on the surface of the earth, consisting of confuses hill masses of igneous and metamorphic rocks, cut by deep ravines a number of which are "rift" valleys.

In 1912 he produced a new geological map of Egypt, scale 1 : 1.000.000, which embodied much labour and was a great advance on existing maps. It was accompanied by a volume of *Explanatory Notes* in which he gave a brief account of the geological history of North Africa and a description of the formations that had been recognised in Egypt with their geographical distribution; also a table showing the strata that occur in the western Desert, Nile Valley and Delta, Eastern Desert and in Sinai respectively; followed by a table showing the distribution of economic products in Egypt.

His greatest work is the Geology of Egypt in three volumes divided into six parts.

Volume I—which deals with the surface features of Egypt, their determining causes and relation to geological structure,—was published in 1925.

Volume II—on the Fundamental pre-Cambrian rocks of Egypt and the Sudan, their distribution, age and character,—appeared in three parts.

Part I. *The Metamorphic Rocks,* in 1934.

Part II. *The later Plutonic and minor Intrusive Rocks,* in 1935.

Part III. *The minerals of Economic importance associated with the intrusive pre-Cambrian Igneous Rocks and Ancient Sediments,* in 1937.

The pre-Cambrian covers an area of about 100.000 square kilometres in Egypt and Sinai and very little of this has been mapped on scales larger than 1 : 500.000 Most of our knowledge of the igneous and metamorphic rocks of these regions has been derived from reconnaissance surveys and rapid traverses. Hume has attempted to divide the pre-Cambrian into four Periods or Episodes and though further work may lead to their modification they provide a useful basis for the detailed survey of the pre-Cambrian of the Eastern Desert which is now in its initial stage. This volume is beautifully illustrated and contains coloured plates of rocks, minerals and microscope slides.

Volume III—Part I deals with *The older Sedimentary Rocks from the close of the pre-Cambrian Episodes to the end of the Cretaceous Period.*

Part II. *The Tertiary to Recent.*

The text of this volume was completed in 1945 but the preparation of the plates and was seriously interfered with by Hume's absence from Egypt during the war, and it needs some re-arrangement and much work on the illustrations before it will be ready for the Press.

These volumes contain a comprehensive account of the geology of Egypt, derived from Hume's wide knowledge and experience of Egyptian geology and his careful study of the work of others in the voluminous literature relating thereto. They illustrate the great advance that has been made since he joined the Geological Survey.

Hume had the honour of enjoying the esteem of His Majesty King Fouad I and His Majesty King Farouq I and Their interest in his work was a great encouragment to him.

He was decorated with the Order of Ismail, 2nd Class, in 1938, having previously received the Order of the Nile both 3rd Class and 2nd Class.

Hume was a Doctor of Science of London University.

Fellow of the Royal Society of Edinburgh.

Associate of the Royal College of Science in Geology.

Associate of the Royal School of Mines in Metallurgy.

Fellow of the Geological Society of London, which awarded him the Lyell Fund in 1896 and the Lyell Medal in 1919.

Fellow of the Royal Geographical Society of London.

Member of the Geologists' Association and

President of the Littlehampton Natural Science and Archaeological Society.

Hume's linguistic abilities coupled with a naturally amiable manner gained for him many friends of different nationalities, while his kindly and charitable nature endeared him to all with whom he came in contact and his loss will be deeply felt.

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Bulletin No. 1. *Preliminary Geological Report on Abu Durba* (Western Sinai), 1921.
— No. 2. *Preliminary General Report of the Occurrences of Petroleum in Western Sinai*, 1920.
— No. 3. *Preliminary Geological Report on Gebel Nezzazat* (Western Sinai), 1920.
— No. 4. *Preliminary Geological Report on Gebel Tanka Area*, 1920.
— No. 5. *Preliminary Geological Report on the Quseir-Safaga District*, 1920.
— No. 7. *Preliminary Geological Report on South Zeit Area*, 1920.

IN MANUSCRIPT.

Notes and Comments on the Literature of the Geology of Egypt.

Pre-Cambria. A comparison of the Egyptian pre-Cambrian formations with those of other countries.

Geology of Egypt, Vol. III.

Part I. *The older, Sedimentary Rocks from the close of the pre-Cambrian Episodes to the end of the Cretaceous Period.*

Part II. *The Tertiary to Recent.*

LIST OF ABBREVIATED TITLES.

BA. = *Rept. Brit. Assoc. Adv. Sci. 78th Meeting.*
BA. = *Rept. Brit. Assoc. Adv. Sci. 81st Meeting.*
BA. = *Rept. Brit. Assoc. Adv. Sci. 84th Meeting.*
BSRG. = *Bull. Soc. Royale Géogr.*, Le Caire (formerly Soc. Sultanieh).

BSSG. = *Bull. Soc. Sultanieh Géogr.,* Le Caire.
CIA. = *C. R. Congr. Intern. Agrogéol.,* Stockholm.
CIA. = *C. R. Congr. Intern. Agropédologique,* Prague.
CIG. = *C. R. Congr. Intern. Géol.,* Paris.
CIG. = *C. R. Congr. Intern. Géol.,* Stockholm.
CIG. = *Proc. Intern. Geol. Congr.,* Ottawa.
CIG. = *C. R. Congr. Intern. Géol.,* Liège.
CIG. = *C. R. Congr. Intern. Géogr.,* Le Caire.
CIG. = *C. R. Congr. Intern. Géol.,* Madrid.
CIG. = *Proc. Intern. Geogr. Congr.,* Cambridge.
CIG. = *C. R. Congr. Inter. Géogr.,* Paris.
CNM. = *C. R. Congr. de Navigation Maritime,* Le Caire.
CSJ. = *Cairo Scientific Journal,* Cairo. The first volume was published as *"Survey Notes"*.
GJ. = *Geographical Journal,* London.
GM. = *Geological Magazine,* London.
GS. = *Geological Survey of Egypt,* Cairo.
JIPT. = *Journal of the Institution of Petroleum Technologists,* London.
MIE. = *Mémoires présentés à l'Institut d'Égypte,* Le Caire.
PGA. = *Proceedings of the Geologists Association,* London.
PGS. = *Proceedings of the Geological Society,* London.
SD. = *Survey Department reports and papers,* Cairo.
SN. = *Survey Notes,* Cairo.—Volume I of *Cairo Scientific Journal.*

CHRONIQUE GÉOGRAPHIQUE.

Le XVI^e^ Congrès international de Géographie

(Lisbonne 1949).

A moins de quatre ans de la fin d'une guerre qui a tout bouleversé, un pays, petit par ses dimensions mais grand par sa contribution à la science géographique, a pu organiser dans sa belle capitale, et mener à bonne fin, le XVI^e^ Congrès international de géographie. Ce pays, c'est le Portugal. Les descendants de Henri le Navigateur n'ont pas reculé devant l'ingrate besogne d'organiser un congrès, surmontant des difficultés de toutes sortes, et cela juste à un moment où le monde n'a pas encore retrouvé son équilibre après la profonde secousse qui vient de l'ébranler.

Le Congrès a incontestablement atteint son but; le grand nombre de savants, venus de tant de pays pour nous mettre au courant des résultats de leurs travaux, l'atteste. Les discussions et les échanges de vues se sont déroulées dans une atmosphère très sympathique et extrêmement cordiale. De très intéressantes excursions nous ont fait connaître les aspects si divers du Portugal; aspects physiques et humains de ce pays au climat à la fois océanique et méditerranéen, pays de plaines et de montagnes, pays où les vieilles traditions sont toujours vivantes et savent, très souvent, s'allier aux exigences de l'économie moderne.

Trois excursions promenades d'une journée chacune nous permirent de visiter Lisbonne et ses environs [1]. Les géographes eurent ensuite le choix entre cinq grandes excursions simultanées qui durèrent une semaine [2]; enfin il faut ajouter

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[1] *a*) Excursion de l'Arrabida, *b*) excursion de Sintra, Cascais et Estoril et *c*) visite de la ville de Lisbonne et des environs.

[2] Excursion *A.* — Minho, Tras-os-Montes et vallée du Douro.
— *B.* — Le centre littoral et le massif calcaire d'Estremadura.
— *C.* — Le Portugal central.
— *D.* — Estremadura et Ribatejo.
— *E.* — Bas Alentejo et Algarve.

la croisière à l'île de Madère. Chaque excursion, minutieusement préparée, a été l'objet d'un livre-guide de 200 pages environ. L'ensemble de ces livres-guide constitue une belle monographie régionale et offre une mise au point de tous les problèmes de géographie physique et humaine du Portugal.

Qu'il nous soit permis ici de rendre hommage au Comité d'organisation et plus particulièrement à son actif secrétaire, le Professeur Orlando Ribeiro, qui s'est dépensé sans compter pour mener à bien sa tâche. Ceux qui ont eu la chance d'assister aux excursions dirigées par lui ont pu apprécier ses grandes qualités de géographe.

Lors de l'Assemblée générale de clôture, M. J. B. Cressey (E. U. A.) a été élu Président. M. le Prof. Emm. de Martonne, président sortant et qui aurait dû devenir vice-président conformément aux statuts de l'Union géographique internationale, fut élu président d'honneur à vie. La tempête d'applaudissements qui accompagna cette décision disait clairement combien ce faible hommage rendu à l'éminent savant qu'est Emm. de Martonne était apprécié de tous les géographes présents.

Le Comité exécutif a été constitué comme suit :

Président d'honneur à vie :	Prof. Emm. de Martonne (France).
Président	Prof. J. B. Cressey (E. U. A.).
Vice-présidents	Prof. R. Almagià (Italie).
	Prof. M. A. Lefèvre (Belgique).
	Prof. O. Ribeiro (Portugal).
	Prof. Leite de Castro (Espagne).
	Prof. Dudly Stamp (Grande-Bretagne).
	Prof. Hans Boesch (Suisse).
	Prof. G. H. Kuriyan (Inde).
Secrétaire	Prof. G. H. Kimble (Canada).

La délégation égyptienne était composée de :

Mohamed Awad bey, Directeur général de la Culture au Ministère de l'Instruction publique.

Hussein K. Selim bey, Doyen de la Faculté du Commerce à l'Université Fouad Ier du Caire.

Ahmed S. Huzayyin, Professeur à la Faculté des Lettres de l'Université Farouk Ier d'Alexandrie.

Hassân M. Awad, Secrétaire général de la Société royale de géographie d'Égypte.

Ces membres ont présenté des communications très intéressantes et ont participé aux discussions scientifiques des différentes sections. Il est utile de souligner

l'intérêt de ces contacts entre les membres des diverses délégations. Ils ne peuvent que profiter aux uns comme aux autres. Les géographes égyptiens auront à cœur de travailler durant cette intersession ; des directives émanant de différentes commissions nous seront envoyées et nous les communiquerons à nos collègues en vue de la préparation scientifique du prochain congrès, dont le siège sera New-York en 1952.

Hassân Awad.

A visit to Zanzibar.

While the members of the University of California African Expedition were carrying out their scientific programme in East Africa, his Highness the Sultan of Zanzibar extended a cordial invitation to them to further their scientific programme so as to include the Island of Zanzibar.

A party of five persons including Professor Gelal H. Awad of the Farouk University and myself, left Mombasa on board s. s. *Kandhala* on June 15th 1948 on their way to Zanzibar.

Early next morning the boat was moving along the western coast of the island, and at about 10 a. m. arrived at the port of Zanzibar. As it was steaming slowly in the harbour, we were struck with the strange beauty of the view which gradually opened out before us. Contrary to what we anticipated, everything looked fresh and green and an oriental glamour of enchantment seemed to hang over the town. It was bathed in brilliant sanshine and reflected itself on the motionless sea, with its red sloping roofs and dazzling white walls. The whole town seemed as if it peeped out of a thick forest of waving coco-nut palms and spreading mango trees. The soft breeze which blew off the town carried to our boat the most fragrant scent of the Clove trees which grow everywhere on the island, thus adding to the beauty and enchantment of the place.

The day after their arrival, the members of the expedition went to work on their varied scientific programme.

The Expedition's programme in invertebrate palaeontology was conducted by Professor Awad. In Zanzibar only the pliocene and pleistocene are represented, fossils are rare and generally not well preserved. Dr. Awad collected a number of specimens of molluscs from the pecten werthi beds, representing the only fossiliferous pliocene beds. The Mazingini sands, which overlie these are non-fossiliferous, but they are of interest for the type of erosian they give, which results in a formation of extremely picturesque earth pillars which are well represented

in the Mazingini Ridge and at Walezo. Studies were carried out on the Azania series of the pleistocene and Dr. Awad collected some fossil shells at Kisimkasi.

The Expedition's programme in anthropology was conducted by myself. During the short time allotted to me, I carried out anthropological measurements of over 200 adults of Wahadimu, Watumbatu, Wapemba and Shirazi tribes.

One of the major objectives of my programme was to identify the racial stock or stocks from which the natives of Zanzibar are derived and to specify whether they are mainly Africans, Arabs or a mixture of both.

Although it will take some time before the final results of these measurements can be obtained, there is enough evidence to show that the members of these tribes represent a mixture of several different races in which the Bantus, the Persians of Shiraz, the Arabs of southern Arabia have contributed a great deal. Realising that the Bantus are not pure negroids, but a mixture of Hamites and negroid elements, we can easily understand that a high percentage of the blood that runs in the veins of the natives of Zanzibar is Asiatic. This blood has been transferred to the island by human waves that came from Persia, Iraq and southern Arabia along the sea route which has been drawn and defined by the monsoons which sweep over the northern part of the Indian Ocean and link the Asiatic and African worlds.

The geographical situation of the island has recommanded it to be the meeting place of human waves coming from the Asiatic world on one side and from Africa on the other. From Africa came the original inhabitants of the island and these were pure negroids. They probably came from the region of the Great Lakes of Africa century after century drifting eastwards. Then, about the 1st century of the christian Era, the Bantu people, who are a mixture of Hamites who came from Asia and the negroid races of Africa, invaded the country and intermarried with the aborigines.

There are two kinds of Bantus; those who live in the parklands and those who live in the forest. The former are pastoral people who clothe themselves in skins, make coiled basket-work, have circular huts and live chiefly on grain. The latter are an agricultural people who wear clothing of vegetable material, make woven basket-work, build rectangular houses and live chiefly on roots. It seems probable that the natives of Zanzibar and Pemba islands are descendants of forest Bantu people.

From the Asiatic world there came wave after wave along the sea route which is clearly defined by the monsoons. Up till now, the Arab dhows visit the islands every season and still link the islands with the Asiatic world. From time immemorial the Asiatic people have been making this sea voyage from Asia in summer time and from Africa back in Winter. This is what the Arabs call "Rihlata Shita Wa Ssaif".

We need not emphasise the relationship which existed and still exists between

the Arabs of Asia and Zanzibar as the rulers of Zanzibar at present are Arabs from Oman. There is also a large Arab community who form the Aristocracy amongst the population of the island and who own most of the "shambas" and cultivated land.

There is also enough evidence to show that the Persians of Shiraz were in close relation with the islands. There is a whole tribe in both Zanzibar and Pemba who call themselves Shirazi and who are the descendants of the Shirazi Persians who came to the islands. There was a time when Persia was a powerful country and had control of the sea routes between Asia and Africa. Their dhows visited the islands which were then subjected to the Persian rule. As a matter of fact, the "Zendj Empire" or (The Empire of the Blacks) was a Persian Empire founded by a Persian of the name Hasan.

We need not either emphasise the relationship which exists between India and the islands, as there is a large community of Indians amongst the population of Zanzibar. They are the merchants and craftsmen of the islands, and they are thriving.

The relationship with India is very old, because we know from definite legends which still exist both in Zanzibar and Pemba, that certain people called "Wadeba" came to the islands before the Persian Shirazis. It is also affirmed that they came constantly, that they settled there, planted coco-nut trees, and had sailing ships of palm leaves. It is believed that their home was "Dabbol" a port of considerable historic importance on the west coast of India. It used to do a great deal of trade all over the East in olden days.

There is little doubt that the Malays come to these islands too. They reached Madagascar and South Africa, where they left traces of their language.

The *Antimerina* of Madagascar are known to be derived from the Malay invasion of about four hundred years ago. Customs which occur elsewhere only in Malay are also known in Zanzibar. The customs observed at the birth of a child among the natives of Zanzibar are almost exactly the same as those practised in Malay, and much of the magic of Zanzibar has strong resemblances to that of the Malays. Areca, betel and sugar-cane are indigenous to Malay and it is possible that they were originally brought there by the Malays. The habit of betel-chewing may also owe its origin to the same source.

There is also definite historical proof to show that the Chinese were in close relations with the islands. Besides the Chinese coins and pottery which have been discovered in Kilwa and Mafia, the Arab geographers tell us that when great troubles arose in China, the Chinese transferred their trade to some island called "Zandj". Again we learn from Chinese historians that Mogadiscio was visited by a Chinese fleet in 1430 for trading purposes. At the ruins of the ancient town of Mkumbuu and at other places in Pemba, many fragments of Chinese pottery have been found and these show definite relationships with China.

The word Zanzibar is derived from the Arabic words "Zenj" meaning "a black" and "Bar" meaning "Coast", thus Zanzibar originally meant the whole coast of Africa, and has in course of time come to indicate the island which now bears that name.

It is only in 1832 that Zanzibar was selected to be the capital of the Arab East African Empire. It had many advantages to recommend it as the capital of that Empire. Owing to its convenient position off the centre of the coast, it was obviously capable of developing into the centre of trade and commerce for the whole of East Africa. In addition, its safe harbour and the fact that it possessed a good water supply, were bound to attract passing vessels, while its situation in the monsoon belt kept it in close touch with the Asiatic world. The island itself was exceedingly fertile so that there was every prospect that agriculture would flourish.

The town of Zanzibar is very compact, its buildings being closely attached one to the other and its streets being exceedingly narrow. We would have had great difficulty in driving the Expedition's trucks through then, and had to give up the idea of using them, their place being taken by little cars of English make, the only ones available there.

The town is quite Arabic in design and plan, and the houses are built of stone, this is why it is called the stone town. It is the rule that houses consist of three floors the ground one being left for the servants, while the other two being used for living. The doors are all made of hard wood, and are lavishly decorated with carvings and studded with pointed brass nobs and provided with brass bolts and lockets; all of which add to the grace and splendour of the scenery.

Most fascinating of all is "Beit El Agaib" or "House of wonders". It stands next to the Sultan's palace and is considered the best piece of architectural work in the whole town. It is a big building of four floors, the highest in the town, with a huge wooden gate with doors and ceilings beautifully decorated with gold. It was once used as a palace for the Sultan, but is now used as offices for the Government.

The pygmy character of the cars used in the narrow streets of Zanzibar reflects itself again in the pygmy buses used on the roads which extend all over the island.

Notwithstanding the fact that the roads are kept in a fairly good condition, they are so narrow that it is practically impossible for either trucks or big cars to run over them. These roads are the only means by which the different parts of the island are linked together, as the island is devoid of railways.

For economic purposes, an American Company undertook the construction of a railway line from the capital to Bububu, a distance of about fifteen miles, but had to give it up as the plan proved to be a failure. Now all transportation on the island is carried out by a small type of bus and cars which fits quite well with the limited width of the roads.

From the economic point of view, the island of Zanzibar is quite fertile and

there is enough land to provide the whole population with their means of subsistence. As far as food supply is concerned, the island is up till now self sufficient being able to produce rice, bananas, mango and casava enough to feed the people.

As to cash crops, both clove and coco-nut trees are grown in such big numbers that the island is counted as the leading country in clove production, yielding about 95 % of the world production. But it is important to note that the clove trees have lately been attacked by an unknown pest which brings sudden death to them. Unless the inhabitants of Zanzibar think of another eash crop such as sugar canes or cotton to take the place of clove trees, the wealth of the whole island would be greatly endangered. It is also of importance that while the inhabitants of the island are rapidly increasing in number, the area of the island and consequently of the land that supports the population is limited and there will come a time, and it will soon come, when the food supplies raised on the island will not be enough to feed the people.

Zanzibar and the Arab Rulers of Zanzibar contributed a great deal in suppressing the slave trade. Many people erroneously believe that the Arabs of East Africa originated the slave trade that was carried out in that corner of the world. As a matter of fact, the history of this trade on the East Coast of Africa is almost as old as the history of the coast itself.

We know from the "Periplus" that in the olden days of the Roman Empire, slaves were exported from this part of the world. It seems that the early visitors who came to the Eastern Coast of Africa in ancient times were partly attracted by the profit to be made in trading in slaves. The lure of that trade, however, attracted not only the Eastern nations, for soon after the western Nations as well commenced to open up the coast. They likewise began to participate in this profitable business. One of the chief factors which led Prince Henry the Navigator to push ahead with the exploration of the West Coast of Africa had been the desire to obtain cheap slave labour.

There is enough evidence to show that the English people who in the XIXth century carried the torch of freedom and preached for the suppression of the slave trade, carried out that trade themselves in the XVIIIth century, and were responsible for the transference to North America of the African slaves who were brought there to cultivate the land. In a similar way the French, the Spaniards and the Portuguese traded in slaves.

The Arabs too participated in the slave trade, and it is because they were the first traders to settle on the Eastern coast of Africa, that they were responsible for bringing from the central parts of Africa the large numbers of slaves who used to be sold in the Markets of Mombasa, Kilwa, Malindi and Zanzibar.

When the time came for public opinion to turn against trade in human beings, the Arabs of Zanzibar participated in suppressing it. Zanzibar was, in fact, the centre of this trade for the whole of East Africa, the slaves being brought in to

work in clove plantations and to be exported in thousands to Arabia, Persia and Egypt. Nevertheless, Zanzibar took the lead in suppressing that trade and the Sultan of Zanzibar was as enthusiastic in suppressing it as the English people themselves.

The Sultan of Zanzibar began his campaign against the slave trade by prohibiting the sale of slaves to any christian nation, then to Arabia. He afterwards closed all the slave markets in his dominions, with the inclusion of that of Zanzibar itself, thus contributing a great deal towards the suppression of that trade.

It is important to note that the Arabs of Zanzibar were responsible for paving the way for Great Britain to colonise East Africa. It is a known fact that the British people were not the first Europeans to appear in East Africa, as they were second to the Portuguese who immediately after the successful voyage of "De Gama" round the cape of Good Hope in appeared on the scene and subjugated the Arab States of Kilwa, Zanzibar, Mombassa and Malindi.

Had it not been for the Arabs continual fighting against the Portuguese for about one century and a half afterwhich they regained the land, the latter would have collaborated with both the Africans and the Arabs of East Africa, and faced the British when they first appeared in this part of the world. Accordingly there would have been no chance for Great Britain to annex the territories of East Africa to the British Empire.

MOHAMAD MITWALLY.

L'activité de la Société d'Études historiques et géographiques de l'Isthme de Suez en 1948 [1].

Le 25 janvier 1948, la Société d'Études historiques et géographiques de l'Isthme de Suez a tenu sa troisième Assemblée générale sous la présidence du Docteur Godel, en présence de MM. François Charles Roux, George Edgard Bonnet et de nombreux membres de la Société. Les secrétaires Alfred L. Fontaine et Jean Edouard Goby ont présenté un rapport sur l'activité scientifique de la Société en 1947. En vue d'élargir le recrutement, une modification aux statuts fut votée : désormais, sont aussi admis au sein de la société des *amis* qui ne sont pas tenus, comme les membres actifs, de poursuivre des recherches personnelles.

La Société a organisé plusieurs excursions scientifiques dirigées pour la plupart par A. L. Fontaine. La plus importante eut lieu le 14 mars : elle eut pour objet

[1] Cf. *Bull. Soc. Roy. Géog.*, t. XXII, p. 97-98 et 169-170.

de reconnaître les vestiges du Canal des Pharaons entre Ismaïlia et les lacs Amers. D'autres excursions, où les participants furent moins nombreux, furent dirigées vers Tanis et Salayen.

Quatre *Notes d'information* ont paru de janvier à avril 1948, formant un ensemble de 52 pages 31 × 21 ronéotypées. On y trouve une étude de Mme WITWOET sur *Quelques médicaments dans l'ancienne Égypte* et de pénétrantes remarques de G. DEBIEN, *A propos du Courrier de l'Égypte*. On peut lire de larges extraits d'une brochure de V. CADIAT, *De la situation des travaux du Canal de Suez en février 1868* et le début de la reproduction d'un récit de voyage de Charles DIDIER, *Du Caire à Suez en 1854*. Enfin, J. E. Goby a donné une première liste, comportant 174 numéros d'ouvrages et d'articles sur l'Isthme et le Canal de Suez antérieurs à 1900 qui ne sont pas mentionnés dans la bibliographie, pourtant si remarquable, de l'ouvrage de J. Charles ROUX, *L'Isthme et le Canal de Suez*.

Le tome I du *Bulletin de la Société d'Études* a paru en mai 1948. Il se présente avec un sommaire un peu différent de celui que nous signalions dans la précédente chronique.

J. E. Goby a d'abord exposé les conditions dans lesquelles la Société avait été formée. A. L. Fontaine a défini ensuite les régions et sites anciens intéressant la Société. Il en a dressé une carte accompagnée d'un index. Puis viennent des études de Jacques Daumas et Charles Laroche sur le Gebel Lahram, A. L. Fontaine sur Daphnae, André Servin sur Kantarah, Jean Boulad sur le service postal dans l'Isthme de Suez, Delsol sur les travaux de Panama comparés à ceux de Suez. Le volume se poursuit par des comptes rendus bibliographiques et se termine par une note sur le *Code de classification décimale de la Société* mis au point par les deux secrétaires et utilisé systématiquement pour le classement des fiches, pour la présentation des articles des *Notes d'information* et du *Bulletin*.

Le tome II est actuellement prêt à être imprimé. Il renfermera des mémoires de J. Daumas, A. L. Fontaine, J. E. Goby, Pierre Mennessier, Paul Reymond, Jacques Schwartz et A. Servin, plus un certain nombre de comptes rendus et articles divers.

J. E. G.

[Voir page suivante : STATISTIQUES.]

STATISTIQUES.

Classement de la population par Gouvernorats et Provinces d'après les chiffres préliminaires du recensement de 1947.

Gouvernorats et Provinces.	Sexe masculin.	Sexe féminin.	Totaux.
Gouvernorats.			
Caire	1,066,872	1,033,634	2,100,506
Alexandrie	468,846	457,733	925,081
Canal	129,277	117,543	246,770
Suez	56,903	51,347	108,250
Damiette	27,060	26,560	53,620
Totaux	1,747,410	1,686,817	3,434,227
Districts des Frontières.			
District de la mer Rouge	14,020	8,045	22,065
— du Sinaï	20,602	17,259	37,897
— du Désert du Sud	15,525	16,766	32,291
— — de l'Ouest	35,115	33,404	68,519
Oasis «Baharia»	3,542	3,201	6,743
Totaux	88,804	78,711	167,515
Provinces de la Basse Égypte.			
Béhéra	598,527	647,116	1,245,643
Gharbieh	1,132,201	1,202,086	2,334,287
Dakahlieh	693,304	722,922	1,416,226
Charkieh	672,072	684,726	1,356,798
Menoufieh	570,446	598,331	1,168,777
Kalioubieh	341,991	345,178	687,169
Totaux	4,008,541	4,200,359	8,208,900
Provinces de la Haute Égypte.			
Guizeh	410,853	413,090	823,943
Béni-Souef	296,923	316,442	613,365
Fayoum	327,246	344,639	671,885
Minia	521,655	536,568	1,058,223
Assiout	688,495	690,409	1,378,904
Guerga	642,120	646,305	1,288,425
Kéna	552,422	553,874	1,106,296
Assouan	133,203	153,651	286,854
Totaux	3.572,917	3,654,978	7,227,895
Total de la Population	9,417,672	9,620,865	19,038,537
Les nomades	.....	.....	49,320
Total général	.....	.....	19,087,857

Population de l'Égypte dans les différents recensements et l'augmentation survenue entre deux recensements consécutifs.

Année du recensement.	Nombre d'habitants.	Augmentation numérique.	Augmentation pour cent en dix ans.	Moyenne annuelle de l'augmentation pour cent.
1882	6.804.021	—	—	—
1897	9.714.525	2.910.504	28,6	2,9
1907	11.287.359	1.572.834	16,2	1,6
1917	12.750.918	1.463.559	13,0	1,3
1927	14.217.864	1.466.946	11,5	1,2
1937	15.932.694	1.714.830	12,1	1,2
1947 (1)	19.087.857	3.155.163	19,8	2,0

(1) Chiffres préliminaires.

COMPTES RENDUS.

Ch. H. Pouthas, *Histoire de l'Égypte depuis la Conquête ottomane*, Paris, Hachette, in-16, 177 p., 52 ill. ou cartes.

L'*Histoire de l'Égypte depuis la Conquête ottomane,* ouvrage d'enseignement, est destiné essentiellement aux élèves des établissements français du Proche-Orient qui désirent « connaître l'histoire de leur pays d'origine ou d'adoption ». Mais c'est aussi un excellent précis que l'on pourra consulter, si l'on veut s'informer des faits majeurs de l'Égypte depuis le XVI^e^ siècle et reconsidérer, sous l'angle oriental, le déroulement des événements mondiaux. On a parfois dénoncé avec raison les préjugés de l'historiographie de l'Europe occidentale, se plaçant elle-même au centre de l'évolution du monde ; cette fois-ci, réjouissons-nous plutôt de ce que l'emploi judicieux de la méthode historique permet la reconstitution, d'une manière cohérente et ordonnée, du passé récent de la vallée du Nil.

Le manuel, conçu selon les principes de la célèbre collection scolaire des « Cours d'histoire Malet », a pour règles fondamentales l'objectivité et la clarté. S'adressant à un public de lycéens et de jeunes étudiants, il s'attache à une présentation concrète des problèmes. Il ne se contente d'ailleurs pas d'exposer, il veut encore fournir nombre de documents à l'appréciation directe du lecteur : gravures extraites de la *Description de l'Égypte* ou photographies ; traductions d'auteurs arabes, pages de voyageurs français (Volnay, Gérard de Nerval) ; il leur offre aussi de succinctes bibliographies.

Un premier chapitre rédigé par R. Clément nous conduit, de 1517 à 1798, à travers l'Égypte ottomane ; l'attention est portée sur l'étude de l'organisation politique et administrative : pasha, divan, milices, beys et mamlucks, impôts et douanes ; un tableau de la civilisation égyptienne présente en 14 pages les conditions économiques (ressources du pays et commerce), les villes et leurs riches demeures, les éléments de la population (Mamlucks, Coptes, fellahs et bédouins), la vie intellectuelle et les arts ; c'est ainsi une intéressante initiation à une période trop souvent dédaignée.

Ch. H. Pouthas, professeur à la Sorbonne, qui a dirigé l'ouvrage, a traité lui-même la période décisive de la fondation de l'Égypte moderne, celle où se sont dessinées les lignes maîtresses d'une Égypte rénovée, sous Mohamed Aly. Après

avoir sommairement caractérisé l'enthousiasme créateur de Bonaparte et des savants de l'expédition d'Égypte, l'historien insiste sur les campagnes de Mohamed Ali et d'Ibrahim en Arabie, au Soudan, en Morée, en Syrie, avant d'étudier leur activité intelligente et constructrice d'organisateurs du pays.

La seconde moitié de l'ouvrage comprend trois chapitres où J. B. Duroselle a dégagé avec netteté les aspects majeurs d'un siècle d'histoire égyptienne (1849-1937); le magnifique essor économique et culturel sous les premiers successeurs de Mohamed Ali, l'installation des Anglais en Égypte et la modernisation du pays; le réveil du sentiment national et la conquête de l'indépendance avec le roi Fouad et Zaghloul Pasha. L'ouvrage nous mène jusqu'à l'acte de Montreux du 8 mai 1937, à travers les crises qui éclatèrent après la Grande Guerre. Durant tout un siècle, on peut suivre la remontée régulière et continue de l'influence égyptienne au long du Nil : conquête de la Nubie, du Kordofan et du Sennaar en 1820-1821 (p. 64-65), progression au Bahr-el-Ghazal et au Darfour en 1874, extension vers l'« Equatoria» (p. 111-114), révolte du Mahdi et reconquête du Soudan par les troupes anglo-égyptiennes (p. 132-142). Plusieurs cartes schématiques ajoutent encore à la clarté de cet exposé qui constitue une mise au point sommaire, mais cependant utile et nourrie.

Nous permettra-t-on pourtant d'exprimer un léger regret? Le clair regard de J. F. Champollion — haute figure de génie et de distinction, — nous attendions sa rencontre en ouvrant ce livre; nous imaginions aussi y voir Mariette-Bey et G. Maspero sur leurs chantiers de fouilles; le dessin du Comte de Forbin, qui montre Drovetti mesurant un fragment de colosse en Haute Égypte (p. 83), est un témoignage bien peu significatif de l'œuvre féconde des archéologues en Égypte. Ramenant à la vie les cités des morts et des dieux, ils ajoutèrent pourtant « quarante siècles» à l'histoire du monde et rendirent à l'Égypte la tradition millénaire de l'Empire des Pharaons.

Jean Leclant.

ACTES DE LA SOCIÉTÉ.

LIVRES REÇUS EN 1948-1949.

I. — ÉGYPTE ET SOUDAN.

Arkell, A. J., *Report on the Antiquities Service and Museums,* 1947, Khartoum s. d., 19 p. (Don du Gouvernement du Soudan.)

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Ayrouth, H. H., *The Fallahin,* Cairo s. d., in-8°, 179 p.

Breccia, E., *Monuments de l'Égypte gréco-romaine. Publication de la Société Royale d'Archéologie d'Alexandrie,* Bergamo 1926, 2 vol., in-4°, 76 planches hors texte. (Don de la Société Royale d'Archéologie d'Alexandrie.)

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Hume, W. F., *Terrestrial Theories. A digest of various views as to the origin and development of the Earth and their Bearing on the Geology of Egypt,* Cairo 1948, in-8°, 160 p. (Don du Geological Survey in Egypt.)

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Sauvaget, J., *La Poste aux chevaux dans l'Empire des Mamelouks,* Paris 1941, in-8°, 96 p., 21 fig., 8 planches hors texte. (Don de l'Institut français de Damas.)

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Carreira, A. et Marques, J. B., *Subsidios Para o estudo da lingua manjaca,* S. L. 1947, in-8°, 175 p. (Don du Centro de Estudos de Guiné Portuguesa.)

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Maurette, F., *Afrique équatoriale et australe* (Géographie universelle publiée sous la direction de Vidal de la Blache et L. Gallois), t. XII, Paris 1938, in-8°, 389 p., nomb. figures.

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III. — ASIE.

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Blanchard, R., *Asie occidentale, Haute Asie* (Géographie universelle publiée sous la direction de Vidal de la Blache et L. Gallois), t. VIII, Paris 1929, in-8°, 394 p., nomb. figures et cartes.

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Fawcett, Ch., *The travels of the Abbé Carré in India and the Near East,* 1672 to 1674. (Hakluyt Society, vol. II, série II, vol. XCVI), London 1947, in-8°, xxiv + 358 p.

Forbin, V., *Les richesses de l'Asie,* Paris 1946, in-8°, 344 p.

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Hobman, J. B., *Palestine's Economic Future,* London 1946, in-8°, 310 p.

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Lasker, B., *Les peuples de l'Asie en mouvement. Les migrations humaines modernes en Chine, au Japon, aux Indes, en Malaisie, etc.,* Paris 1946, in-8°, 200 p.

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IV. — AMÉRIQUE.

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TSCHOPIK, H., *Highland Communities of Central Peru. A Regional Survey,* Washington 1947, in-8°, 56 p., 16 planches. (Don du Smithsonian Institution.)

V. — EUROPE.

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FIELD, H., *Contributions to the Anthropology of the Soviet Union,* Washington 1948, in-8°, 244 p., 5 planches en hors texte. (Don de l'auteur.)

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—— *Rapport sur l'activité de l'Institut géographique national,* année 1945, Paris 1948, in-8°, 101 p., 12 planches hors texte. (Don de l'Institut géographique national.)

—— *Rapport sur l'activité de l'Institut géographique national,* année 1946, Paris 1948, in-8°, 107 p. + 1 vol. de 18 cartes en hors texte. (Don de l'Institut géographique national.)

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LEMERLE, P., *Permanence de la Grèce.* Éditions des Cahiers du Sud, Paris 1948, in-8°, 386 p. (Don du Consulat royal de Grèce.)

MARTONNE, Em. DE, *Manuel de la recherche documentaire en France,* t. II, 1re partie, 2e section de Géographie, Paris 1946, in-8°, 101 p.

MAURAIN, Ch., *Le climat parisien,* Paris 1947, in-8°, 162 p., 20 figures.

SWEDEN, W. OF, *This Land of Sweden,* Stockholm 1946, in-8°, 392 p., 25 figures, 1 carte.

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VI. — AUSTRALIE.

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VIII. — GÉNÉRALITÉS.

BATTOUTA, B., *Histoire des Phéniciens,* Le Caire 1947, in-8°, 141 p. (Don de l'auteur.)

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—— *Dania Polyglotta.* II : Périodiques, études et articles, Copenhague 1948, in-8°, 522 p. (Don de l'Institut danois des Échanges internationaux de Publications scientifiques et littéraires.)

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الكتب العربية التى دخلت مكتبة الجمعية

ابو القاسم حسين بن على بن المغربى : كتاب فى السياسة — عنى بنشره وتحقيقه وتعليق حواشيه سامى الدهان — دمشق ١٩٤٨ ، ١٤٠ ص (هبة من المعهد الفرنسى بدمشق)

أبى فراس الحمدانى : ديوان أبى فراس الحمدانى — عنى بجمعه ونشره وتعليق حواشيه ووضع فهارسه سامى الدهان — بيروت ١٩٤٤ ، ثلاثة أجزاء

الجمعية الملكية للدراسات التاريخية . ذكرى البطل الفاتح ابراهيم باشا ١٨٤٨ – ١٩٤٨ . مجموعة أبحاث ودراسات لعدة مؤلفين تنشرها الجمعية بمناسبة انقضاء مائة عام على وفاته . القاهرة ١٩٤٨ – ٤٠٥ ص (هبة من الجمعية)

أوستن ميلر : علم المناخ — عربه محمد متولى وابراهيم رزقانه القاهرة ١٩٤٨ ، ٢٠٧ ص

زكى محمد مجاهد : الأعلام الشرقية فى المائة الرابعة عشرة الهجرية من ١٣٠١ إلى ١٣٦٥ (١٨٨٣ – ١٩٤٦) . القاهرة — ١٧٧ ص . (هبة من المؤلف)

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عبد الرحمن زكى : الشرق الأوسط — القاهرة ، ٢٦٦ ص (هبة من المؤلف)

عبد القادر بن محمد النعيمى الدمشقى : الدارس فى تاريخ المدارس . الجزء الأول دمشق ١٩٤٨ ، ٦٦٥ ص . (هبة من المجمع العلمى العربى)

محمد رفعت : الأطلس التاريخى — لندن ١٩٢٦ ، ٥٥ خريطة (هبة من السفارة البريطانية)

محمد عوض محمد : نهر النيل — الطبعة الثانية . القاهرة ١٩٤٨ ، ٣٣٩ ص .

مصلحة عموم الاحصاء والتعداد : احصاء الموظفين والمستخدمين بالحكومة والهيئات العامة فى أول يناير ١٩٤٦ . القاهرة ١٩٤٨ ، ٤٧ ص (هبة من المصلحة)

مصلحة عموم الاحصاء والتعداد : احصاء شركات المساهمة التى يوجد استغلالها الرئيسى فى مصر : القاهرة ١٩٤٨ ، ١٢٥١ ص (هبة من المصلحة)

كوركيس وميخائيل عواد : رسائل أحمد تيمور إلى الأب انستاس مارى الكرملى بغداد ١٩٤٧ ، ١٦١ ص (هبة من المؤلفين)

يوسف البديعى . أوج التحرى عن حيثية أبى العلاء المعرى . دمشق ١٩٤٤ . ١٧٦ ص (هبة)

EXTRAIT DES PROCÈS-VERBAUX
DU
CONSEIL D'ADMINISTRATION
DE LA
SOCIÉTÉ ROYALE DE GÉOGRAPHIE D'ÉGYPTE

SÉANCE DU 14 MAI 1947.

Présidence de S. E. Chérif Sabry pacha.

Sont présents :

S. E. Hassan Sadek pacha, *vice-président*.
MM. Vincenot, *trésorier*.
le Dr Ét. Drioton.
G. Wiet.
Moustafa Amer bey.
O. H. Little.
Chafik Ghorbal bey.
Hussein Kamel Selim bey.
Dr Mohamed Awad bey.
G. W. Murray.
M. Hassan Awad, *secrétaire général*.

Abd El-Rahim Osman bey se fait excuser.

ORDRE DU JOUR :

1° Admission de nouveaux membres.
2° Rapport du Secrétaire général sur l'activité scientifique de la Société en 1946-1947.
3° Approbation du budget de 1946-1947 et prévisions budgétaires pour 1947-1948.
4° Questions diverses.

I. — ADMISSION DE NOUVEAUX MEMBRES.

Le Conseil décide de nommer Adly Andraos bey, Directeur de l'Administration européenne au Cabinet de Sa Majesté le Roi, membre de notre Conseil d'Administration.

Le Conseil admet ensuite au titre de membres de la Société :

a) Abd El-Khalek Metaweh bey, *directeur général du Survey Department.*

Lady Russell pacha.

M. Ibrahim Chérif, *lecteur de géographie à l'Université Farouk Ier.*

M. A. Fontaine, *attaché à la Compagnie du Canal de Suez à Ismaïlia.*

M. Maurice Carmona, *professeur au Lycée Franco-Égyptien de Mansourah.*

M. Sélim Bahri, *premier substitut au Contentieux de l'État, Direction des Affaires judiciaires mixtes.*

b) Membres décédés ou démissionnaires :

Dr A. Azadian, Mourad Mohsen pacha, Ismaïl Teymour pacha décédés.

Mohamed Ibrahim Hassan, E. Alessandrini, R. Bowen, Mlle W. Bircher, M. E. Colombe, Dr L. Dori, H. R. Fedden, Moukhtar El-Gawhari, J. Hilpern, Général Koecklin-Schwartz, R. Laffitte, Abd El-Aziz Moustafa, Aly Abd El-Méguid Omar, E. F. H. Sawyer, L.-M. Salinas, Mlle Dawlat Sabet, Ch.-E. Thiébaud, Mohamed Mohamed Tewfik, Mlle L. Warriner, Youssef Khalil Youssef, E. Beach, démissionnaires.

II. — RAPPORT DU SECRÉTAIRE GÉNÉRAL SUR L'ACTIVITÉ SCIENTIFIQUE DE LA SOCIÉTÉ EN 1946-1947.

I. — Bibliographie internationale.

La Bibliographie internationale des sciences géographiques est une œuvre issue de la collaboration de six sociétés géographiques parmi lesquelles se trouve notre Société Royale. Sa publication arrêtée provisoirement par la guerre est en train de reprendre actuellement. Aussi avons-nous pu envoyer cette année plus de cinquante fiches concernant des travaux géographiques, ouvrages et articles publiés en Égypte pendant les années 1945 et 1946. Un autre envoi avait déjà été effectué l'an dernier pour les années 1940-1944. La plupart de ces fiches portait une analyse succincte mais aussi précise que possible.

II. — La Bibliothèque.

Notre Bibliothèque s'est enrichie des plus récents ouvrages de géographie, tant par des achats que par des dons. Nos membres en verront pour la première fois la liste dans notre *Bulletin* sous la rubrique « Livres reçus ». D'autres part, nous avons séparé dans une armoire les ouvrages de langue arabe. Pour ces ouvrages, nous avons établi un fichier spécial en arabe ; il va sans dire que cela facilitera la recherche de nos lecteurs.

III. — Les Revues.

En vue de compléter les revues et périodiques que nous recevions avant guerre, par échange ou par abonnement, nous nous sommes empressés durant cette année 1946-1947 de reprendre nos relations avec les autres sociétés de géographie. Ainsi avons-nous pu combler les lacunes existantes.

Nous avons également établi des relations avec de nouvelles sociétés qui publient des *Bulletins* géographiques intéressants et sérieux. Par voie d'échange nous avons commencé à recevoir :

Le *Bulletin de l'Association des Géographes Français.*

Le *Bulletin de la Société Belge d'Études Géographiques.*

Les *Travaux et Bulletin du Séminaire de Géographie de Liége.*

Les *Mémoires et Bulletin de l'Institut Français d'Afrique Noire.*

Le *Bulletin du Service des Mines de l'A. O. F.*

Le *Bulletin de la British Glaciological Society.*

Les *Travaux de l'Institut de Recherches Sahariennes de l'Université d'Alger.*

En calculant le nombre de revues et périodiques que notre Société reçoit à l'heure actuelle, nous trouvons :

par échange : 115 revues, Bulletins ou Périodiques.

par abonnement : 14 Périodiques.

IV. — Les Publications.

Notre attention a été plus particulièrement retenue par deux choses : le *Bulletin* et l'ouvrage de M. Kammerer.

Nous nous sommes fait un devoir dès notre entrée en fonction de relever notre *Bulletin,* ou tout au moins de préparer le terrain en vue de ce relèvement. Nous voulons remédier à deux graves maux dont il souffrait, à savoir : d'abord sa parution très irrégulière et espacée (il est resté dernièrement vingt mois sans paraître), et ensuite la disparition de son caractère géographique ; les études non géographiques l'emportaient de beaucoup. (Je me suis livré à un petit calcul et j'ai constaté que durant la décade 1936 à 1946 les articles qui ont un caractère essentiellement géographique ne dépassent pas 30 % ; avec la géologie, on arrive à 40 %.)

Si cet état de chose continuait, il risquerait de porter atteinte au rôle de notre *Bulletin* en tant que revue géographique.

Nous avons donc essayé d'atténuer ces deux maux. C'est ainsi que le dernier fascicule a paru en août et qu'un autre aurait déjà paru si l'imprimerie y mettait un peu plus de bonne volonté (les manuscrits y sont depuis plus de trois mois). Je pense que d'ici un mois il sortira des presses, et l'on pourra constater à ce moment les changements notables tant au point de vue de la présentation qu'au point de vue des sujets traités.

Nous avons porté un soin tout particulier à la présentation ; les caractères typographiques diffèrent selon qu'il s'agisse d'un article principal, d'une chronique ou d'une simple note. Nous nous sommes préoccupés également des graphiques, des planches, des photographies et des cartes hors-texte.

Le premier article du prochain numéro de notre *Bulletin* portera la signature de M. E. de Martonne et il aura pour titre : *Les déserts de l'Amérique du Sud*. C'est le texte de sa conférence de l'année dernière à la Société qu'il avait spécialement écrite pour notre *Bulletin*. Vient ensuite un important mémoire de M. l'abbé Étienne de Vaumas sur *Les terrasses d'abraison de la côte libanaise*. C'est la première fois, à notre connaissance, qu'une

étude d'ensemble a été élaborée sur cette région. L'auteur est un jeune géographe dont l'activité scientifique ne fait que s'accroître depuis plusieurs années et il se trouve actuellement en mission au Liban. Son travail est accompagné de plusieurs figures et planches, et surtout de trois cartes morphologiques hors-texte à l'échelle de 1 : 100.000e (réduites des levées au 1 : 50.000e). Ce numéro contient en outre une note sur *l'évolution structurale des pays du Levant et des régions voisines* où nous avons essayé de retracer l'histoire géologique de ce Moyen Orient arabe d'après le récent ouvrage de M. Leo Picard : *Structure and Evolution of Palestine with Comparative notes on the Neighbouring countries.*

En ce qui concerne l'ouvrage de M. Kammerer, on sait que le tome III n'a pas encore vu le jour. Toutefois l'imprimerie de l'Institut français d'Archéologie orientale a repris l'impression de cet important ouvrage et le travail est déjà très avancé.

La dépense totale estimée par l'Institut s'élèverait à L. E. 2.000 pour l'impression de ce tome troisième. Renseignements pris, l'auteur a versé L. E. 1.044 en vue de faire face à une bonne partie des frais ; il reste donc un millier de livres à trouver.

Sur la proposition de S. E. le Président, le Conseil décide que désormais le rapport scientifique de notre Société devra être présenté au Palais afin que notre Auguste Souverain prenne connaissance de nos efforts.

III. — APPROBATION DU BUDGET DE 1946-1947 ET PRÉVISIONS BUDGÉTAIRES POUR 1947-1948.

M. le Trésorier fait l'exposé de l'état suivant des recettes et des dépenses du 1er mai 1946 au 30 avril 1947 :

Recettes.

	L. E. m/ms.
Vente de publications	388,912
Cotisations	192.—
Subvention du Ministère de l'Instruction publique	1.470,995
	2.051,907
Report de l'exercice précédent	2.685,194
	4.737,101

Dépenses.

	L. E. m/ms.
Frais d'édition de publications	423,527
Personnel	1.537,500
Bibliothèque	63,446
Conférences	2,800
Aménagement	21,040
Fournitures de bureau	19,940
Affranchissement, téléphone, électricité et eau	55,938
Frais divers	63,372
Impôts et taxes	2,040
	2.189,603
Solde à reporter [1]	2.547,498
	4.737,101

Il donne ensuite l'état suivant des prévisions budgétaires pour l'année financière 1947-1948 :

Recettes.

	L. E. m/ms.
Vente de publications	100. —
Cotisations	150. —
Subvention du Ministère de l'Instruction publique	1.470. —
	1.720. —
Report de l'exercice précédent	2.547. —
	4.267. —

Dépenses.

	L. E. m/ms.
Bulletin	800. —
Kammerer	?
Personnel	1.500. —
Bibliothèque	100. —
Aménagement	200. —
Conférences	20. —
Fournitures de bureau	20. —
Affranchissement, téléphone, électricité et eau	60. —
Frais divers	117. —
	2.817. —
A reporter	1.450. —
	4.267. —

[1] Compte du Secrétaire, L. E. 20 ; National Bank, Caire, L. E. 2.525,498 ; Cautionnement, L. E. 2. Total : L. E. 2.547,498.

M. Vincenot fait remarquer, une fois de plus, la situation anormale du budget de la Société. Les recettes (ventes de publications, cotisations et subvention du Gouvernement) suffisent à peine pour couvrir les traitements du personnel et les frais généraux. La Société sera donc obligée, sous peu, de chercher ailleurs les fonds nécessaires aux frais d'édition des nouvelles publications.

A ce propos, le Secrétaire général informe le Conseil de la reprise de l'impression du tome III du *Mémoire* de M. Kammerer : « La mer Rouge, l'Abyssinie et l'Arabie. » L'imprimerie de l'Institut français d'Archéologie orientale du Caire a déjà reçu à titre d'acompte, de l'auteur, les sommes suivantes :

	L. E. m/ms.
Le 15.6.1939 (£ 200)	195. —
Le 19.6.1939	350. —
Le 6.8.1946	499,362
Total	1.044,362

Mais le devis présenté par l'imprimerie s'élève à L. E. 2.000 environ. Il nous reste donc à trouver, approximativement, un millier de Livres égyptiennes.

M. le Trésorier, après avoir retracé l'historique de cette affaire, nous dit que la Société, à la veille de la guerre, avait pris l'engagement de fournir L. E. 300 une fois l'impression de ce tome terminée. Mais les événements ont amené une augmentation dans les frais prévus.

La question reste en suspens, M. le Trésorier devant rencontrer M. Kammerer cet été en France.

IV. — QUESTIONS DIVERSES.

La Salle des conférences. — Le feutrage des sièges décidé par le Conseil dans la dernière réunion a été effectué.

Au sujet des haut-parleurs, le Secrétaire général a fait de nombreuses démarches auprès de l'Administration des Bâtiments de l'État ; cette dernière a refusé de faire l'installation des haut-parleurs à ses frais. Nous avons donc été obligés de faire appel à l'Administration des Télégraphes et Téléphones de l'État. Le Directeur général, S. E. Choucri Abaza bey, nous délégua les ingénieurs de l'Administration qui ont fait des essais très satisfaisants. Choucri Abaza bey nous a promis de faire acheter le

matériel nécessaire à l'installation, dont le prix de revient seulement sera à la charge de la Société.

Le Musée. — La question du Musée est soulevée de nouveau. Le Conseil a émis le vœu que les collections en dépôt au Musée et appartenant au Ministère de l'Instruction publique soient cédées à notre Société.

Le Conseil approuve le don :

a) de quelques-unes de nos publications à Sir Charles Webster pour London School of Economics and political Science ;

b) de toutes les publications spéciales à M. J. Tagher, Conservateur de la Bibliothèque Privée de Sa Majesté le Roi.

L'ordre du jour étant épuisé, la séance est levée à 7 h. 30 p. m.

SÉANCE DU 6 JANVIER 1948.

Présidence de S. E. Chérif Sabry pacha.

Sont présents :

S. E. Hassan Sadek pacha, *vice-président*.
MM. Vincenot, *trésorier*.
le Dr Ét. Drioton.
G. Wiet.
Moustafa Amer bey.
O. H. Little.
Chafik Ghorbal bey.
Hussein Kamel Sélim bey.
G. W. Murray.
Adly Andraos bey.
Hassan Awad, *secrétaire général*.

Abd El-Rahim Osman bey et le Dr Mohamed Awad bey se font excuser.

ORDRE DU JOUR :

1° Admission de nouveaux membres.
2° Subvention du Gouvernement.
3° Publications de la Société.
4° Questions diverses.

Le procès-verbal de la séance précédente est approuvé.

S. E. le Président souhaite la bienvenue à Adly Andraos bey qui assiste pour la première fois à la réunion du Conseil d'Administration.

I. — ADMISSION DE NOUVEAUX MEMBRES.

Le Conseil admet au titre de membres de la Société les personnes suivantes :

a) S. E. Naguib Salem pacha, *Administrateur général des Biens Privés de Sa Majesté le Roi*.
Sésostris Sidarous pacha.
Mlle Liliane Dori, *de la Faculté de Grenoble*.
Aminah El-Sébai, *Professeur aux Écoles Secondaires du Gouvernement*.
MM. Jean Raillard, *Agent Principal du Transit de la Compagnie du Canal de Suez*.
Battersbey, *Rédacteur au journal* « Sphinx ».
Dr Mohamed Abd El-Moneim El-Charkaoui, *Professeur à la Faculté des Lettres*.
Dr Ahmed Fakhry, *Conservateur au Musée Égyptien*.
Sayed Mohamed Khalil, *Professeur aux Écoles Secondaires du Gouvernement*.
Moustafa Hag Ibrahim, *Membre de la Mission Syrienne au Caire*.
Abd El-Malek Guirguis, *Professeur à l'École Normale de Zeitoun*.
Centre de Coopération scientifique du Moyen Orient.
Abbas Ghaleb, *Inspecteur au Ministère de l'Instruction Publique*.

b) Sélim Sednaoui bey — notre membre — nous a fait une donation de L. E. 10 (dix livres égyptiennes).

c) Membres démissionnaires :

Mohamed Khairy, Ahmed Naguib Hachem, Ahmed Mohamed Ibrahim, Mohamed Rachad Rouchdi, Mme Ruth Sloan, S. A. la Nabilah Aicha Aziz Hassan, Mohamed Reda Madwar bey.

II. — SUBVENTION DU GOUVERNEMENT.

S. E. le Président donne lecture du rapport suivant :

La Société Royale de Géographie reçoit du Ministère de l'Instruction publique une allocation annuelle de L. E. 1470,995 m/ms. En y ajoutant le produit des cotisations de nos membres et la vente des publications,

le total des recettes s'élève à L. E. 1720,995 m/ms. Aussi le projet de budget pour l'exercice 1947-1948 prévoit-il pour les recettes :

	L. E. m/ms.
Ventes de publications	100. —
Cotisations	150. —
Subvention du Gouvernement	1.470,995
	1.720,995
Report de l'exercice précédent	2.547. —

Si la Société possède un reliquat de l'exercice précédent s'élevant à L. E. 2547 et qui servira à la publication du t. III du *Mémoire* de M. Kammerer et autres, ce reliquat n'est qu'accidentel et temporaire. Il a été constitué grâce à des circonstances exceptionnelles dues en grande partie à la guerre (vente plus active de nos publications, interruption de nos achats — revues et livres — à l'étranger, publication réduite — ouvrages et *Bulletin*). En plus la Société est restée un an sans secrétaire général à la suite du décès de M. Munier.

Or le budget type des dépenses de la Société est le suivant :

	L. E. m/ms.
Bulletin	400. —
Frais d'édition des publications	?
Personnel	1.500. —
Bibliothèque	150. —
Conférences	50. —
Fournitures de bureau	50. —
Aménagement	50. —
Musée	50. —
Affranchissement, téléphone, eau, électricité	100. —
Frais divers	100. —
	2.450. —

Ce budget type est un budget minimum.

1° Nous n'y avons pas indiqué les frais de publications qu'il est impossible de prévoir et qui peuvent beaucoup varier d'une année à l'autre.

2° Le traitement du personnel (L. E. 1500) pourrait à première vue paraître excessif. Mais la Société a un personnel nombreux : un secrétaire général, un bibliothécaire, un secrétaire adjoint ; trois farraches assurent l'entretien de sa belle salle des conférences et de son musée ethnographique. Il était nécessaire que la Société s'assurât un secrétaire général pourvu de titres universitaires pouvant développer les relations avec le monde savant et veiller à la rédaction du *Bulletin*.

Tous ces frais ne cadrent plus avec les ressources dont nous disposons. En conséquence une augmentation de la subvention du Gouvernement en vue d'atteindre la somme de L. E. 2.500 s'impose afin que la Société puisse continuer à publier son *Bulletin* complètement renouvelé, à mettre à jour sa Bibliothèque et ses collections de revues et de cartes, et à entretenir ses relations scientifiques à travers le monde.

Ainsi pourrions-nous répondre par une activité plus grande et un zèle toujours croissant à la bienveillance que ne cesse de nous témoigner Sa Majesté le Roi notre Auguste Protecteur.

A la suite de l'exposé de S. E. le Président, le Conseil décide d'écrire au Ministère de l'Instruction publique lui demandant l'augmentation de notre subvention.

III. — PUBLICATIONS DE LA SOCIÉTÉ.

Le Secrétaire entretient le Conseil de la parution d'un fascicule du *Bulletin* au mois d'août dernier. Un deuxième fascicule est actuellement sous presse. Dans ce fascicule figurera, entre autre, l'article de M. de Martonne sur l'excursion du Sinaï, excursion qui fut patronnée par notre Société.

Il annonce d'autre part que l'impression de la première partie du tome III du *Mémoire* de M. Kammerer vient d'être achevée.

S. E. le Président nous donne alors les précisions suivantes sur le *Mémoire* de M. Kammerer.

M. le Trésorier signale l'intérêt du travail entrepris par M. Kammerer et l'effort financier de l'auteur (qui a fourni plus de L. E. 1000). La première partie du tome III vient d'être achevée. La deuxième partie est en impression et sera bientôt prête. Pour aider à la parution de ces deux parties, la Société aura dépensé L. E. 600 environ dépassant largement la subvention antérieurement promise. Le Trésorier souligne que

pour la troisième partie la Société n'est liée ni juridiquement ni moralement.

M. Adly Andraos bey intervient alors en disant qu'on pourrait envisager pour l'impression de la troisième partie une subvention extraordinaire de la Khassa de Sa Majesté le Roi.

M. Wiet fait remarquer que toutes les publications dites spéciales de la Société ont été subventionnées par la Khassa Royale.

M. Drioton rappelle qu'il convient de remettre à Sa Majesté le Roi un exemplaire du tome III première partie qui vient de paraître.

IV. — QUESTIONS DIVERSES.

Nous avons reçu il y a déjà quelque temps la première circulaire du Comité d'organisation du Congrès international de Géographie qui doit se tenir à Lisbonne en septembre 1948. Les relations de l'Égypte avec l'Union géographique internationale ont toujours été maintenues par l'intermédiaire de notre Société.

Chaque pays adhérant à cette Union désigne un Comité national... Jusqu'à présent c'est le Conseil d'Administration de notre Société qui remplit les fonctions de Comité national.

Le Secrétaire de l'Union vient de nous communiquer les renseignements concernant les dates des sessions du Congrès et des excursions. Nous avons fait ronéotyper ce programme et allons incessamment le distribuer à nos membres susceptibles de se rendre au Congrès.

Nous avons reçu également cinq exemplaires du programme de la Commission pour l'étude du peuplement. Deux pour les sections de géographie de nos Universités, un pour la Faculté de Commerce et deux pour la Société qui ont été mis à la disposition des membres.

Nous avons reçu de la Faculté des Lettres de l'Université d'Alexandrie une demande de toutes nos publications historiques. Or nous avons déjà fait un don global de toutes nos publications à l'Université Farouk Ier lors de sa création. Il ne semble donc pas nécessaire de refaire un deuxième don.

L'Institut égyptien de Londres nous a fait une demande dans le même sens. Or la Société lui a déjà fait don de toutes ses publications en date du 18 avril 1944.

Le Dr Ahmed Fakhry, Conservateur au Musée égyptien, s'est rendu au Yémen où il a passé près de trois mois. Il est rentré avec une moisson d'observations très intéressantes. Le Secrétaire général lui a proposé de nous donner une conférence sur ses impressions de voyage et il a accepté.

Le Président entretient le Conseil de la démission de M. Catafago, bibliothécaire de la Société, à partir du 1er février. Le Conseil décide de lui accorder une gratification pour ses années de service et charge le Secrétaire général de le remercier pour les services rendus à la Société durant 17 ans.

L'ordre du jour étant épuisé, la séance est levée à 7 heures p. m.

SÉANCE DU 22 AVRIL 1948.

Présidence de S. E. Chérif Sabry pacha.

Sont présents :

S. E. Hassan Sadek pacha, *vice-président*.
MM. M. Vingenot, *trésorier*.
O. H. Little.
Chafik Ghorbal bey.
Abdel Rahim Osman bey.
Dr Mohamed Awad bey.
G. W. Murray.
Adly Andraos bey.
M. Hassan Awad, *secrétaire général*.

S'excusent : M. Ét. Drioton, Moustafa Amer bey, Hussein Kamel bey, M. G. Wiet.

ORDRE DU JOUR :

1° Admission de nouveaux membres.
2° Rapport du Secrétaire général sur l'activité scientifique de la Société en 1947-1948.

3° Approbation du budget 1947-1948 et prévisions budgétaires pour 1948-1949.
4° Questions diverses.

Le Président ouvre la séance à 6 h. 30 p. m.

Le procès-verbal de la séance précédente est approuvé.

I. — ADMISSION DE NOUVEAUX MEMBRES.

Le Conseil admet au titre de membres de la Société les personnes suivantes :

a) MM. Mahmoud Mohamed Moussa ; Dr Aziz Sourial Attia ; Moustafa Mohamed El Wakil ; Vahé Sévian ; Ali Gamal el Dine Hassanein.

b) Membres démissionnaires :

Sadek Abd El-Malek et Jean Guillon.

II. — RAPPORT DU SECRÉTAIRE GÉNÉRAL SUR L'ACTIVITÉ SCIENTIFIQUE DE LA SOCIÉTÉ EN 1947-1948.

M. le Secrétaire général donne lecture du rapport suivant sur l'activité de la Société en 1947-1948 :

Nous avons publié cette année un fascicule de notre *Bulletin* et l'impression du prochain fascicule est très avancée ; il sortira au plus tard dans les premiers jours de juin. Il contient un article important de M. Emmanuel de Martonne, intitulé : *Reconnaissance géographique au Sinaï*. Ce travail accompagné de plusieurs figures et planches constitue une base solide pour toute étude future de la géomorphologie sinaïtique.

La première partie du tome III du *Mémoire* Kammerer est également sortie. Ce bel ouvrage tiré à 350 exemplaires (dont 100 reviennent à l'auteur) est mis en vente au prix minime de trois livres. De ce fait nos membres ne bénéficieront que de 30 % de remise au lieu des 50 % accordés habituellement.

Les relations avec les organismes scientifiques à l'étranger sont maintenues et même développées. Nous avons établi des échanges avec quatre importants périodiques : 1° *Journal de la Société des Océanistes ;* 2° *Bulletin of the Geological Department,* Hebrew University, Jerusalem ; 3° *Publications de l'Institut de Géographie de Bergen ;* 4° *Geografisca Annales,* édité par la Société suédoise d'anthropologie et de géographie.

Sur le plan de coopération internationale, le Conseil de la Bibliographie internationale de géographie m'a chargé de la rédaction concernant la partie régionale Égypte-Libye. Jusqu'alors nous nous contentions d'envoyer notre collecte de fiches à Paris ; dorénavant les fiches seront analytiques et l'organisation du chapitre nous sera dévolue.

Enfin, nous avons gardé un contact étroit avec l'Union géographique internationale ainsi qu'avec le Comité d'organisation du Congrès de Lisbonne. Nos membres et tous nos Instituts scientifiques ont été tenu au courant de l'organisation matérielle et scientifique de ce congrès, qui se tiendra au mois de septembre prochain. Nos géographes porteront certainement un grand intérêt à cette manifestation. Personnellement nous avons apporté notre contribution et avons fait parvenir à M. de Martonne, président de la Commission des surfaces d'aplanissement, une étude, accompagnée d'une carte, intitulée : *Notes sur la carte de la surface pré-nubienne dans le Sinaï montagneux central* (partie ouest).

S. E. Hassan Sadek pacha, *vice-président,* fait observer qu'il a fait une démarche auprès de S. E. le Ministre de l'Éducation Nationale pour que notre Société soit représentée à ce Congrès. Il propose que le Secrétaire général soit désigné comme représentant de la Société et fasse partie de la délégation officielle de notre Pays.

Le Conseil approuve.

III. — APPROBATION DU BUDGET DE 1947-1948 ET PRÉVISIONS BUDGÉTAIRES POUR 1948-1949.

M. le Trésorier donne lecture de son rapport sur la situation budgétaire du 30 avril 1947 au 28 février 1948 et de son projet de budget pour l'exercice 1948-1949.

Situation du 1er mai 1947 au 28 février 1948.

Recettes.

	L. E. m/ms.
Cotisations	169.—
Ventes de publications	132,115
Subvention du Gouvernement	1.232.—
Report de l'exercice précédent	2.547,498
	4.080,613

Dépenses.

	L. E. m/ms.
Frais d'édition de publications	478,770
Personnel	1.462,250
Conférences	— 550
Bibliothèque	35,830
Fournitures de bureau	14,165
Aménagements	116,923
Affranchissement, téléphone, électricité, eau	40,374
Frais divers	71,902
Impôts	1,930
	2.222,694
Solde à reporter	1.857,919
	4.080,613

Il fait ensuite l'exposé suivant des prévisions budgétaires pour l'année financière 1948-1949.

Recettes.

	L. E. m/ms.
Subvention du Gouvernement	1.500. —
Ventes de publications	100. —
Cotisations	150. —
Report de l'exercice précédent	1.857. —
	3.608. —

Dépenses.

	L. E. m/ms.
Frais d'éditions de publications	500. —
Personnel	1.600. —
Bibliothèque	100. —
Conférences	10. —
Aménagements	50. —
Fournitures de bureau	30. —
Affranchissement, téléphone, électricité, eau	60. —
Frais divers	80. —
	2.430. —
A reporter pour l'exercice 1949-1950	1.178. —
	3.608. —

IV. — QUESTIONS DIVERSES.

1° L'acoustique de notre salle des Conférences ayant toujours été défectueuse, le Conseil décida lors de sa réunion tenue le 5 décembre 1946 d'y faire installer des haut-parleurs.

Nous nous sommes adressés à l'Administration des Télégraphes et Téléphones de l'État. S. E. Choucri Abaza bey a eu l'extrême obligeance de ne nous faire payer que le prix de revient du matériel. Il nous délégua plusieurs de ses ingénieurs qui firent l'installation. Les essais paraissaient satisfaisants. Mais par la suite nous avons constaté que les haut-parleurs fonctionnaient mal et certains conférenciers ont préféré quelquefois s'en passer plutôt que d'imposer au public des sons discordants.

Le Trésorier en a fait l'observation à S. E. Choucri Abaza bey qui une fois encore a bien voulu donner des ordres à ses ingénieurs. Ceux-ci vinrent à plusieurs reprises, ils constatèrent une défectuosité de l'installation et du matériel qu'ils décidèrent de changer ; mais ils ne revinrent jamais.

Ne serait-il possible de recourir encore une fois à S. E. Choucri Abaza bey afin qu'il reprenne l'affaire en mains et exige de ses ingénieurs que le nécessaire soit fait une fois pour toutes ?

M. le Trésorier propose d'écrire, à M. Choucri Abaza bey, une lettre dans ce sens.

2° Le Président met au courant le Conseil de l'engagement, en remplacement de M. Catafago, de Mme Zérounian, qui travaillait aux *Éditions des Lettres Françaises,* Société actuellement en liquidation.

3° Nous pensons que les membres de notre Conseil voudront se réunir, comme chaque année, le mercredi 28 courant à la Mosquée El Rifai à l'occasion de la commémoration de la mort du Roi Fouad Ier.

L'ordre du jour étant épuisé, la séance est levée à 7 heures p. m.

SÉANCE DU 27 JANVIER 1949.

PRÉSIDENCE DE S. E. CHÉRIF SABRY PACHA.

Sont présents :

S. E. HASSAN SADEK PACHA, *vice-président.*
MM. VINCENOT, *trésorier.*
ÉT. DRIOTON.
G. WIET.
O. H. LITTLE.
ABDEL RAHIM OSMAN BEY.
ADLY ANDRAOS BEY.
M. HASSAN AWAD, *secrétaire général.*

S'excusent : CHAFIK GHORBAL BEY, retenu par l'Assemblée générale de la Société Royale d'Études historiques, HUSSEIN KAMEL SÉLIM BEY absent du Caire. Dr MOHAMED AWAD BEY, MOUSTAFA AMER BEY, G. W. MURRAY.

ORDRE DU JOUR :

1° Admission de nouveaux membres.
2° Le Congrès International de Géographie de Lisbonne.
3° Questions diverses.

Le Président ouvre la séance à 6 h. 30 p. m.

Le procès-verbal de la séance précédente est approuvé.

Avant de passer à l'ordre du jour, le Président informe le Comité de la mort de M. Habib Moutran, employé de la Société de Géographie qui a mis fin à ses jours le 26 janvier en se noyant dans le Nil.

Tenant compte des 22 ans de services de M. Moutran, dont les derniers appointements étaient de 1250 piastres, tenant compte également de la situation difficile dans laquelle il laisse une veuve et deux enfants,

le Comité décide d'allouer en faveur de cette famille une somme de deux cents Livres.

Le Comité laisse à M. Vincenot, *trésorier,* le soin de voir comment et à qui sera réservée cette somme.

I. — ADMISSION DE NOUVEAUX MEMBRES.

Le Conseil admet au titre de membres de la Société les personnes suivantes :

a) Mme Ismet Hassan, Mlle Ellen Rizk, MM. Chater Bosaley, Abdel Aziz Abdel Méguid, Edgard Bonnet, Jean Davril.

b) Membres démissionnaires :

MM. Hill, Fernand Debono, Hilpern, Lorenzo, Deighton.

II. — LE CONGRÈS INTERNATIONAL DE GÉOGRAPHIE DE LISBONNE.

M. le Secrétaire général donne lecture de la note suivante :

Le Congrès international de Géographie qui devait avoir lieu à Lisbonne en septembre 1948 a été ajourné au mois d'avril 1949.

Sur les 57 pays invités, 19 seulement avaient envoyé leur adhésion dans le délai prévu. Le Comité d'Organisation, soucieux de faciliter le voyage, de préparer les logements, d'organiser les excursions avait besoin d'avoir en mains dès le mois de juin, la liste complète de tous les participants au Congrès. Or, en raison de difficultés multiples : obtention de visas dans certains pays, de devises dans d'autres, quelques pays se sont abstenus et d'autres n'ont pu envoyer leur souscription à temps. Le Comité d'organisation a donc pensé que quelques mois de plus permettraient à tous les géographes qui s'intéressent à ce Congrès de résoudre tous ces problèmes matériels et d'obtenir de leur gouvernement respectif l'appui nécessaire.

La date du 8 avril a été choisi pour l'ouverture du Congrès. La liste des inscriptions sera close le 28 février.

Nous espérons que notre gouvernement se conformera au désir du Comité d'organisation et qu'il désignera ses représentants dans le plus bref délai. Les Ministères intéressés ont été prévenus par nos soins.

Le Ministère de l'Instruction Publique nous a fait savoir qu'il accepterait notre Secrétaire comme participant à la délégation officielle.

M. Huzayyin, professeur de Géographie à l'Université Farouk Ier et membre de notre Société, est entré en relation avec Mlle Lefèvre. Secrétaire de l'Union géographique internationale, et a discuté avec elle la possibilité d'organiser des journées géographiques en Égypte, l'année prochaine, à l'occasion du 75e anniversaire de la Société.

Il nous a envoyé une lettre dans laquelle il soumet au Conseil un programme d'études et d'excursions en vue de cette commémoration.

Le Conseil décide de constituer un comité restreint composé de M. Vincenot, S. E. Adly Andraos bey et le Secrétaire afin d'examiner l'opportunité d'une telle célébration l'année prochaine.

III. — QUESTIONS DIVERSES.

1° Le Ministère de l'Instruction publique nous a demandé de garnir les vitrines de la Salle du Soudan au Musée de la Civilisation avec des objets de notre Musée.

Il nous sera possible de faire don d'armes, de vanneries, d'instruments de musique sans toutefois abîmer nos collections.

2° Nous avons fait don à M. Wiet de quelques-uns de nos ouvrages historiques qui lui étaient utiles pour ses recherches.

L'ordre du jour étant épuisé, la séance est levée à 7 h. 30 p. m.

Ouvrages publiés par la Société durant la période comprise entre 1939 et 1948.

	Prix en P. Ég.
G. Douin, *Histoire du règne du Khédive Ismaïl*, t. III. *L'Empire africain* : 2e partie (1869-1873), Le Caire 1939	140
3e partie (1874-1876), fascicules A et B, Le Caire 1942	180
G. Marro, *Il corpo epistolare di Bernardino Drovetti*, t. I, Rome 1940	60
Ch. Bachatly, *Bibliographie de la préhistoire égyptienne*, Le Caire 1942	30
G. Wiet, *Jean-Baptiste Trécourt. « Mémoires sur l'Égypte »*, année 1791, Le Caire 1942	35
S. Huzayyin, *Arabia and the Far East*, Cairo 1942	80
H. Munier, *Tables de la « Description de l'Égypte »*, Le Caire 1943	60
Ammar (Abbas), *People of Sharqiya*, t. I-II, Cairo 1944	200
G. Goyon, *Les inscriptions et graffiti des voyageurs sur la grande pyramide*, Le Caire 1944	160
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